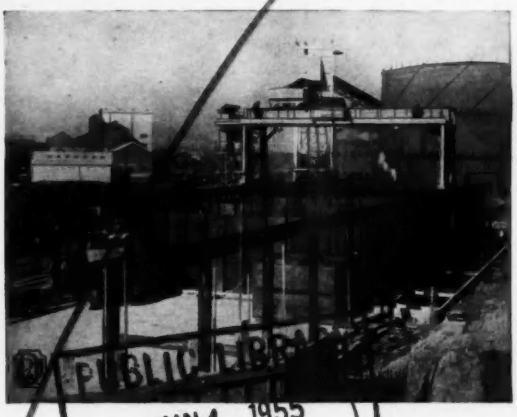
TECHNOLOGY DEPT.

Gas Journal

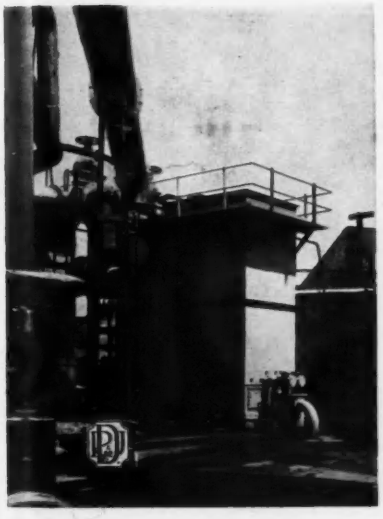
VOL. 282. 107th YEAR. LONDON, MAY 18, 1955. No. 4798. PRICE 1/3

PUBLIC LIBRARY
JUN 4 1955
DETROIT

WASHING PLANT

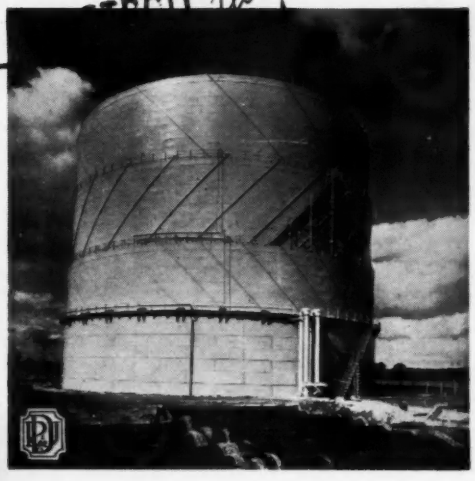


TRAY PURIFIERS



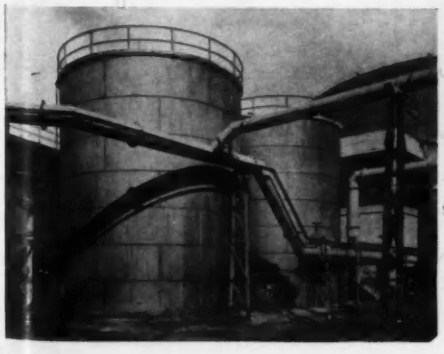
CONDENSERS

ELECTRO-DETARRERS



SPIRALLY-GUIDED GASHOLDERS

WATERLESS (M.A.N.) GASHOLDERS



TANKS

The hallmark of high quality plant

for high quality gasworks plant

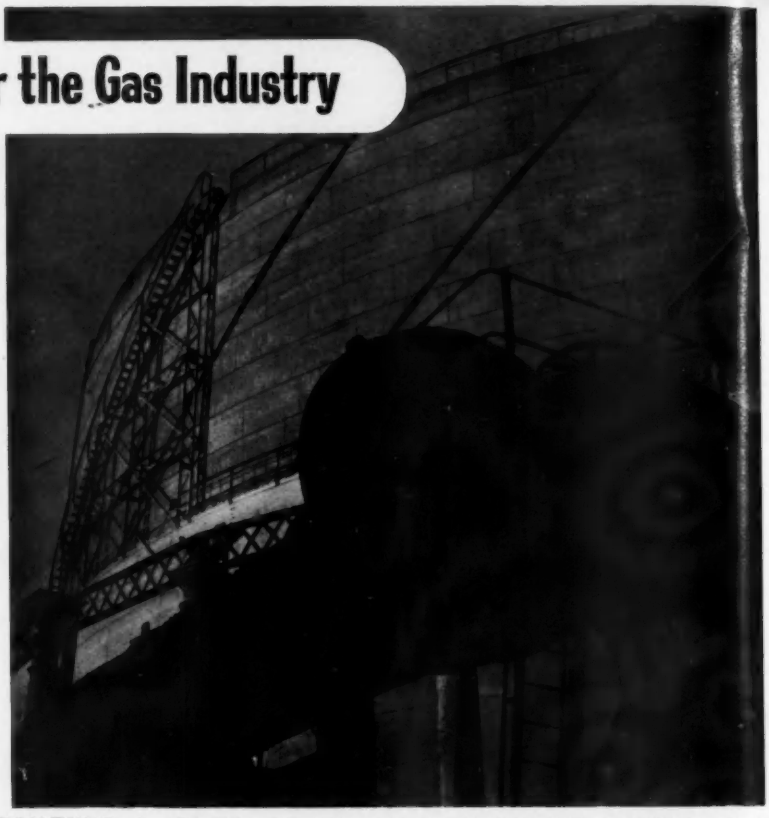
consult

R. & J.
DEMPSTER
Ltd.
Constructional Gas and Chemical Engineers
GAS PLANT WORKS · NEWTON HEATH
MANCHESTER · 10

London Office: 34, VICTORIA STREET, S.W.1.

We make:— BY-PRODUCT and CHEMICAL PLANT · CONDENSERS . DETARRERS . GASHOLDERS · GAS VALVES and CONNECTIONS · IRON CASTINGS · PURIFIERS · STILLS · TANKS · WASHERS · WELDED & RIVETED STEELWORK

Photograph by courtesy of the Gas Council



Aluminium Paints for the Gas Industry

"LUMEROS X" High Heat Resisting Paint.
Represents the latest and greatest advances in the protection of iron and steel subject to very high temperatures. "LUMEROS X" gives adequate protection at temperatures up to 600°C. Good water resistance. No undercoat required. Available in Aluminium or Black.

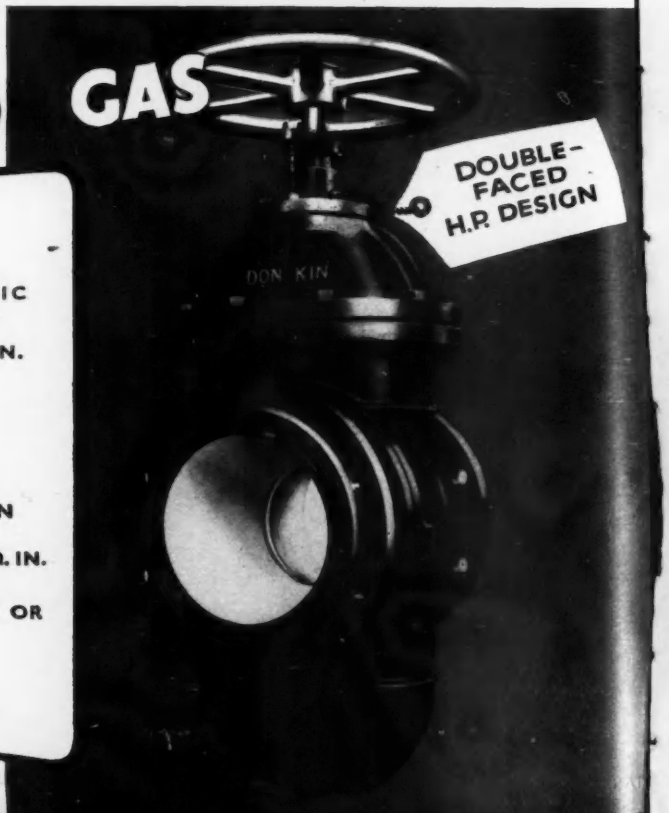
"METTAL" Aluminium Paint.
A general purpose paint of the highest quality and durability and possessing great brilliance. For indoor and outdoor use. Whilst not specifically designed as a heat resisting coating "METTAL" will stand temperatures around 212°F (100°C).

"METTAL" (Thermal).
Specifically designed for indoor and outdoor use on metal surfaces up to 350° F (177°C).

BRITISH PAINTS LIMITED

PORTLAND ROAD, NEWCASTLE-UPON-TYNE, 2. - CREWE HOUSE, CURZON STREET, LONDON, W.1

THE "CL" VALVE FO



- CORROSION RESISTING STEEL DOOR.
- SPECIAL RESILIENT NON-METALLIC COMPOSITION SEATS SELF-LUBRICATED.
- SIMPLE AND ROBUST IN CONSTRUCTION.
- POSITIVE IN OPERATION.
- NO WEDGES OR SPRINGS.
- CANNOT JAM — OPEN OR CLOSED.
- SPINDLE CAN BE RE-PACKED IN THE OPEN OR CLOSED POSITION.
- STANDARD TEST PRESSURE 100 LBS. PER SQ. IN. AIR.
- INTERNAL OR EXTERNAL SCREW WITH OR WITHOUT INDICATOR.

SIZES 3" TO 24"
HORIZONTAL AND VERTICAL

The BRYAN DONKIN CO. LTD
CHESTERFIELD (TEL. 3153) LONDON, MANCHESTER

MEMBER OF THE SOCIETY OF BRITISH GAS INDUSTRIES

Supplement to "GAS JOURNAL" May 18, 1955

SOUTHERN GAS BOARD

EASTERN DIVISION

PORTSMOUTH, GOSPORT, BOGNOR REGIS AND ISLE OF WIGHT GAS UNDERTAKINGS

This pamphlet is issued by kind permission of the Southern Gas Board and has been compiled by R. & J. Dempster, Ltd., of Manchester, in the hope that it will prove to be both interesting and helpful to the Members of the Institution of Gas Engineers on the occasion of their visit to the Portsmouth Gas Undertaking on Wednesday, 25th May, 1955, and the East Cowes Gas Undertaking on Friday, 27th May, 1955

PORTSMOUTH VISIT, May 25, 1955

THE DEMPSTER (MANCHESTER) TRAY PURIFIER INSTALLATION

(Carr & Litler Patent No. 628338)

at

HILSEA WORKS, PORTSMOUTH

The Oxide Purification Plant now in course of erection at Hilsea Gasworks, Portsmouth, is of the modern and improved type manufactured and installed by R. & J. Dempster Ltd., of Gas Plant Works, Newton Heath, Manchester, 10, under Licence from the Patentees who were responsible for the erection of the pioneer installation of Tray Purifiers at York.

THE PURIFIER BOXES

THE Hilsea Tray Purifier installation will have a capacity of 7 mill. cu. ft. per day when completed and comprises a line of four purifier boxes of welded steel construction, each 42 ft. 9½ in. × 29 ft. 6½ in. × 13 ft. 8 in. deep and containing eighteen welded steel trays, each of the trays being fitted with central gasways and two tiers of oxide-carrying grids and supports.

Gas-tight joints are provided between the gasway sections of each tray, consisting of rubber joint rings under compression from the next tray.

Guide angles with hardwood rubber strips are provided to facilitate the location of the trays during the changing of the boxes.

Over the top of each stack of trays a welded steel cover—lagged with fibre-glass insulation mats—is provided, the various covers and trays being handled and transported by means of an overhead travelling crane.

A steel lifting bale is provided for lifting the trays from the boxes.

OVERHEAD CRANE AND GANTRY

THE overhead crane is electric motor driven and of the all-welded plate girder portal type, with access ladders, platform, and handrailing; the crab, operator's cage, travelling motor, and first reduction gear being suitably covered in for working in the open.

The operator's cage consists of an aluminium-sheeted light steel framework and is provided with access doors, armoured glass windows, etc. It is situated at one end of the crane in such a position that the operator has a full view of the load.

The crane is supported on each side of the purifier by means of a broad flanged joist and beam gantry carrying the bridge rails on which the crane wheels run, and electric current is supplied to the crane from the main circuit breaker fixed in the middle of the gantry, through a gravity return cable reeling drum.

30 in. diameter inlet, outlet and return mains are provided, the inlet mains to each box being graded down to 12 in. diameter to feed the centre gasways of each of six stacks of three trays.

30 in. diameter gas valves are provided for operation of the usual backward rotation.

THE installation is equipped with a 7 million cu. ft. per day capacity Gas Preheater of the horizontal type, so constructed that the tubular heating element may easily be inserted or withdrawn. A baffle plate is fitted to prevent the gas from by-passing the heating element in any way, and the temperature of the gas at the heater outlet is thermostatically controlled.

This preheater is supported on a steel structure provided with valve operating platform, handrailing and stands, and an access ladder, and is complete with inlet, outlet, and by-pass valves and connections.

TO provide easy access to the covers the boxes are fitted with balconies, staircases, handrailing and stands.

The boxes are provided with drains, air valves, steaming points, and all necessary instruments, the installation being equipped with a spare set of trays and grids for one box.

THE method of working is as follows:—From the inlet main the gas enters through the bottom of the boxes and is proportionately divided between the number of stacks of trays, passing up the central gasway and out through ports arranged therein to allow the gas to pass upwards and downwards through the tiers of oxide and thence to the space between the trays and the outer casing. From this space the gas is collected and passed to the outlet main, or to the inlet of the following box.

The trays are emptied and refilled in a space provided at the end of the line of boxes, the crane gantry being extended sufficiently beyond the end of the purifiers to facilitate the emptying and filling of the trays.

When changing a box the cover is removed and the trays of foul oxide lifted out and transported to the space at the end of the boxes. The spare trays which have previously been filled with fresh oxide are here lifted up and transported to the box being changed, placed in the box, and the cover replaced. The use of these spare trays enables the fouled trays to be emptied and refilled at any convenient time. Means are provided for loosening the caked oxide to facilitate the tipping of it from the trays.

TRAY PURIFIER ADVANTAGES

TRAY Purifiers of this design and construction provide the advantages claimed for Tower Purifiers, and need fewer men to be employed regularly on purification, with no peak demand on the available labour force. They also lead to more efficient working due to more even charging with oxide.

The total backpressure thrown by Tray Purifiers is relatively low, since each unit volume of gas only passes through 1 ft. 6 in. depth of oxide per box at a very low velocity.

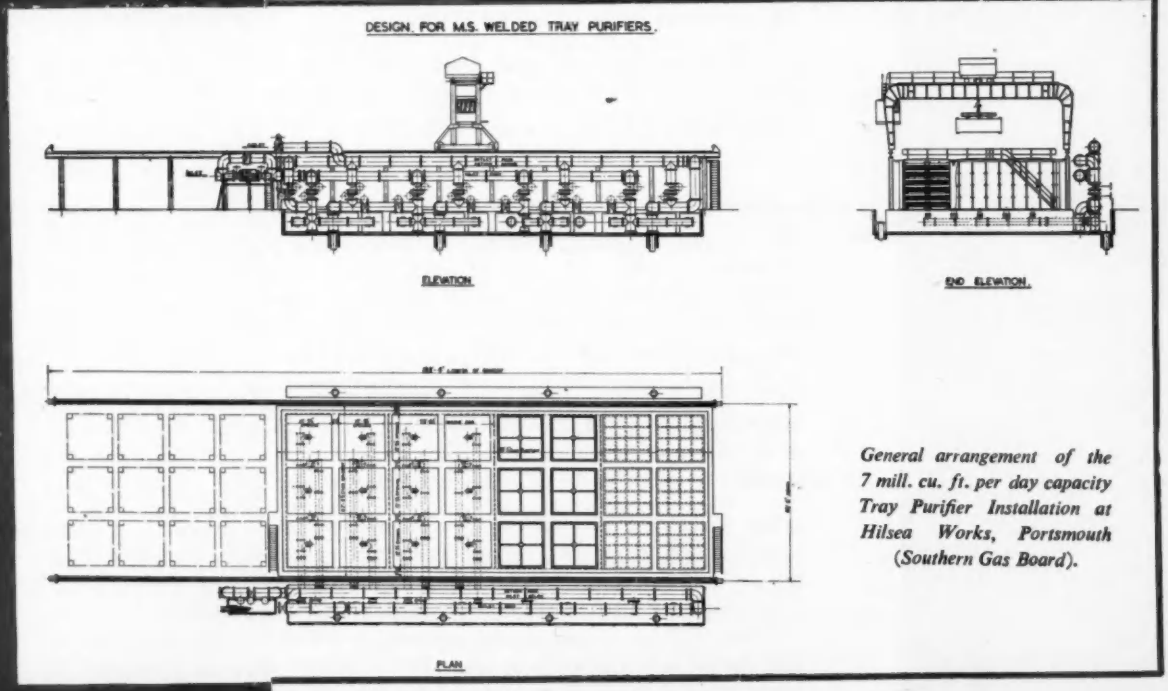
Tray Purifiers of this type are remarkable for the rapidity with which foul oxide can be removed and the new material substituted, with a consequent substantial shortening of the time that any box is "off stream." Working conditions, too, are greatly improved when compared with the emptying and refilling of the older types of ground level dry box Purifiers.

The simplicity of the operation of changing boxes is a most attractive feature of Tray Purifier installations.

This up-to-date purification system is becoming increasingly popular, and more and more Gas Engineers are realising that with Tray Purifiers they can obtain the advantages of SIMPLIFIED BOX CHANGING on the CHEAPEST CAPITAL COST BASIS.

It is interesting to note the following figures concerning the Tray Purifier installations already operating or on order:—

1952	.. ..	4 million cu. ft. capacity
1953	.. ..	26 million cu. ft. capacity
1954	.. ..	36½ million cu. ft. capacity
1955 (April)	..	53½ million cu. ft. capacity



General arrangement of the 7 mill. cu. ft. per day capacity Tray Purifier Installation at Hilsea Works, Portsmouth (Southern Gas Board).

EAST COWES VISIT, May 27, 1955

THE DEMPSTER (MANCHESTER) WET PURIFICATION PLANT AND TRAY PURIFIER INSTALLATION

(Carr & Litler Patent No. 628338)

at

THE CENTRAL WORKS, KINGSTON, EAST COWES

INTRODUCTION

The Wet Purification Plant now in course of erection at the Kingston Gas Works has been designed in collaboration with the Southern Gas Board and manufactured by R. & J. Dempster, Ltd., of Gas Plant Works, Newton Heath, Manchester, 10. When completed this Plant will comprise two Condensers, a Water Cooling Tower, Livesey and Static Washers, and an Electrostatic Detarrer, together with the various valves, connections and accessories. The plant is of sufficient capacity to deal with 3.5 million cu. ft. of gas per day from the first of two projected carbonizing plants. A parallel stream would be installed to deal with the extension to the carbonizing plant at a future date.

The one exception to this plan concerns the condensers. In this case two units are being installed initially, each of 5 million cu. ft. per day throughput so that standby capacity is available and also to prepare for the future maximum of 7 million cu. ft. per day when the full load may be passed through one unit without excessive overload conditions.

Each condenser is of the horizontal gas flow type with vertical tubes and has been designed to cool the gas from 185° to 65° F., using cooling tower water at 70° F. and towns water at 55° F., and will operate on the cooling tower water circuit for the larger part of the cooling duty, with provision for separate preheating of a variable boiler feed.

The design lends itself to incorporation in such a scheme, where two widely different volumes of water are dealt with, in that sub-division of the compartments on the water side is possible to obtain high water velocities without recourse to concurrent flow of gas and water. Such sub-division may be made for exactly the surface area required for that part of the duty.

In this manner, softened towns water (for boiler feed and make-up for the cooling tower) is fed to the gas outlet end of the condenser for a few water passes, leaves the vessel by an external pipe, and is returned to the hot end where its temperature is increased for boiler feed purposes, the quantity then being proportioned between boilers and cooling tower.

The cooling tower supply enters the condenser after the towns water section and leaves before the preheating section.

The reason for using the make-up and boiler feed on the cold gas end is to take advantage of a water temperature below that from the tower and so reduce the gas temperature to as low a figure as possible bearing in mind

the rise across the exhausters and the effect of temperature on ammonia washing.

THE CONDENSERS

THE two Condensers are rectangular in cross section and of welded construction, each being of the water-cooled vertical tube type and having 32 vertical water passes and 3 horizontal gas passes.

The Condensers are equipped with liquor flushing arrangement, thermometers, platforms, ladders, valves and connections, and the method of working is as follows:—The gas enters at the end of the first section of the central compartment, travels horizontally along the first section of the Condenser, and in reverse direction along the second and third passes respectively, and out at the opposite end of the Condenser.

WATER COOLING TOWER

THE Water Cooling Tower is of the all-film flow induced draught—2 cell—type, manufactured and installed by Film Cooling Towers (1925) Ltd., and is designed to cool 21,000 gallons of water per hour, from 120° F. to within 10° of the wet bulb temperature.

The water circulating pump is of the Sigmund type delivering 350 gallons of water per minute when running at a speed of 1440 r.p.m., with a gasworks type motor and starter.

The electrical starting equipment for this part of the plant is connected to the main distribution board in the Detarrer House, as are all the other starters for other parts of the Wet Purification Plant, alternative remote push-button control being available locally at the motor site.

Cast iron water connections and valves are provided between the Pump and the Condensers, and between the Condensers and the inlet to the Water Cooling Tower, provision being made also for the coupling up of future Water Cooler connections.

THE LIVESEY WASHER

THE Livesey Washer is of cast iron construction and has a capacity of 7 million cu. ft. per day. It is fitted with 63 tubes, each 9ft. 0 in. long, removable covers, sight glasses, sludge fittings, liquor inlet, and liquor overflow and fittings.

ELECTROSTATIC DETARRER

THE Electro-Detarrer is of the plate type with a porcelain insulator, and is of welded steel construction. It has a capacity of 3½ million cu. ft. per day, with a tar fog extraction efficiency of 99.5%±.5 and a total power consumption of about 1¾ kW, the pressure drop in the gas treator being not more than ¼ in. w.g.

This Electro-Detarrer is fitted with ladders and platforms and a tar run-off, and the electrical equipment is by the Metropolitan-Vickers Electrical Co., Ltd., the H.T. Rectifier Unit being of compact metal-clad construction and self-screened.

All this electrical equipment is housed in a Detarrer House provided by the Gas Board. In this house is situated the main distribution board, complete with switches, fuses, and circuit breakers, all the starters for the entire contract being connected to the board.

When the Electro-Detarrer is in operation the tar-laden gas enters at the bottom of the treator and passes upwards between negative and positive electrodes on its way to the clean gas outlet at the top.

Because of the voltage gradient set up by the high voltage on the negative wire electrodes the wires are covered by a corona discharge, resulting in an emission of electrons from the wires. These electrons collide with the particles of tar suspended in the gas which consequently acquire a negative electrical charge, and are thus attracted to the positive electrodes to which they adhere, and from where they finally drain down to the tar sump at the bottom of

the treator, while the cleaned gas passes upwards through the vessel to the outlet at the top.

THE Static Washer is of welded steel construction of 3½ million cu. ft. per day capacity and has been designed to work at 70° F. producing a strong liquor with a slip of 4 grains ammonia per 100 cu. ft. of gas.

It comprises two sections, each of four chambers and fitted with wired weed bristle filling of our improved principle, the chambers being irrigated by means of liquor sprays of an improved type.

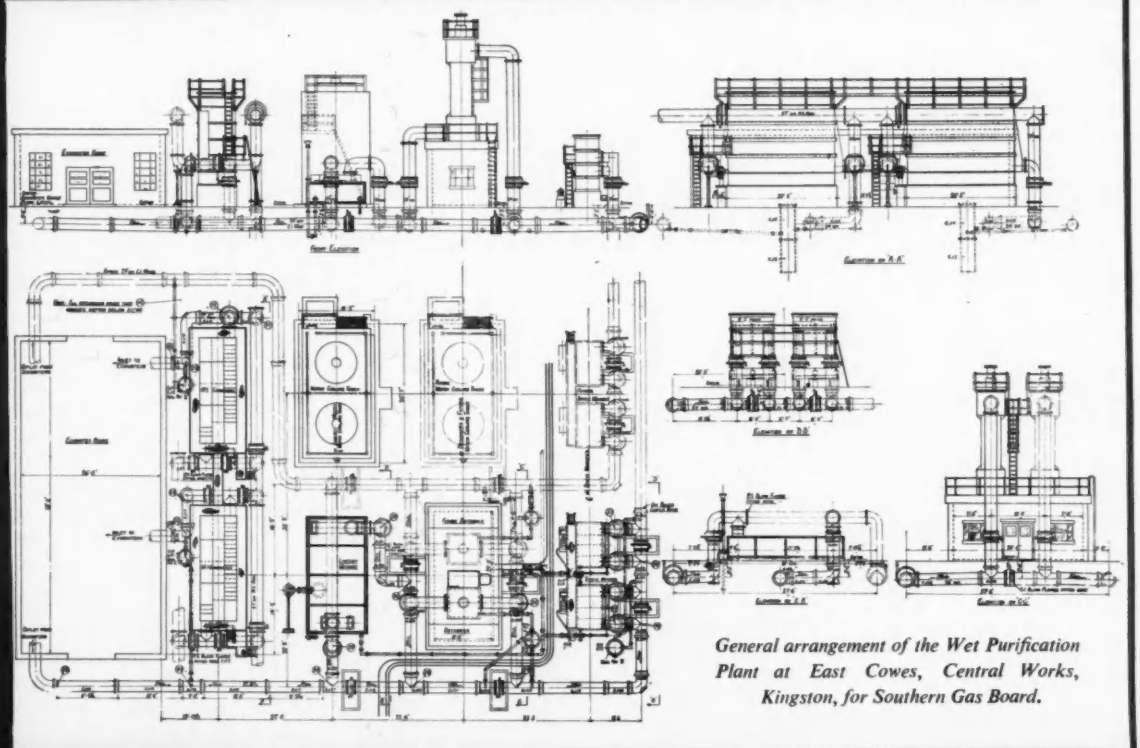
Inspection windows are provided to facilitate observation of the working of the sprays.

Each section of the Washer is equipped with a motor-driven quadruple centrifugal pump, and thermometers, platforms, ladders, etc., are also provided.

When the Static Washer is in operation the gas enters the inlet at the last washing chamber, travels across, and through the openings in the division plate to the next chamber, and so through the remaining chambers, and out at the first chamber of the first section.

The gas travels in a similar manner through the second section of the Washer, and is washed in its passage through the eight chambers, this method ensuring that the whole of the gas passes through the filling.

Clean water enters the washer at the gas outlet end, passes into the liquor compartment of the first washing chamber, and is pumped up to the top of this chamber. This water sprays the filling, passes down to the liquor compartment, and overflows into the liquor compartment of the second washing chamber, where the same process is repeated. In this manner the liquor sprays all the washing chambers and leaves the washer at the gas inlet end.



General arrangement of the Wet Purification Plant at East Cowes, Central Works, Kingston, for Southern Gas Board.

TRAY PURIFIERS

TRAY Purifiers are to be installed to deal with 3.5 million cu. ft. per day, each box being 31 ft. 6½ in. × 30 ft. 0 in. × 9 ft. 5 in. deep. There will be four boxes in line of welded steel construction, forming one unit, each box containing eight trays.

A welded plate girder portal type crane will be provided spanning the boxes and travelling on a steel gantry running the length of the boxes and beyond to serve the stacking and discharging bay.

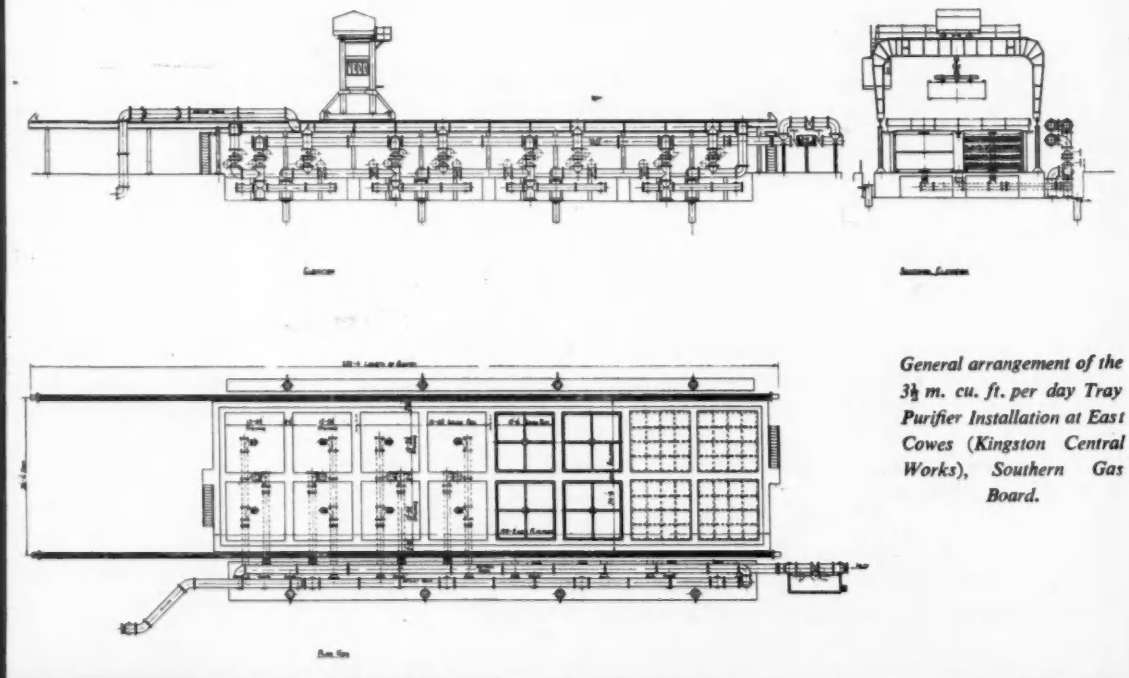
The crane is electrically driven, all motors, gears and crab being suitably housed.

Four covers per box are supplied and fouled trays removed through the openings, trays already containing the fresh charge being returned in a similar manner. It is apparent that a box may be back on the gas stream in a matter of 3-4 hours in this type of plant and this advantage is of great importance in a four box set.

Gas enters a box in four places, being divided between the eight trays. Each tray contains a central gasway, the gas passing out through ports in the gasway to flow up through the top layer of oxide and down through the lower and thence to the space between the trays and the outer casing. In this instance two such trays would form a stack, a gastight joint being provided between the gasway sections of the trays, consisting of a rubber joint ring under compression from the upper tray.

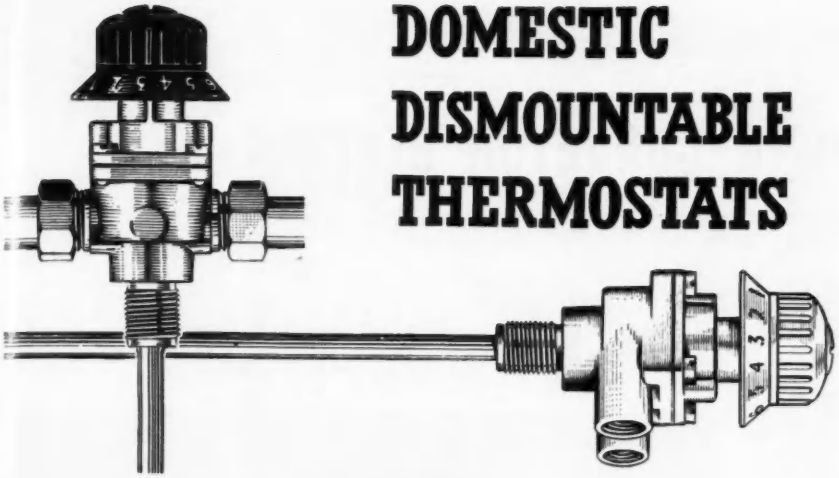
The welded steel trays have been designed for tipping on the ground and means are provided for rupturing hard oxide to facilitate emptying.

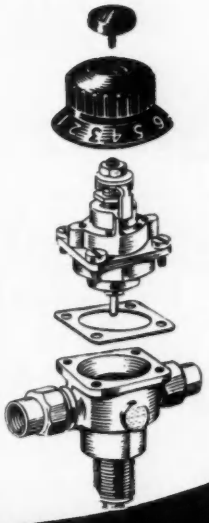
No special equipment is necessary, the larger lumps of oxide being fed through a crusher and/or a disintegrator for stock or sale. Filling is accomplished by means of a mechanical shovel or portable conveyor feeding the tray at ground level.



General arrangement of the 3½ m. cu. ft. per day Tray Purifier Installation at East Cowes (Kingston Central Works), Southern Gas Board.

DOMESTIC DISMOUNTABLE THERMOSTATS





Domestic Dismountable Thermostats

Extreme simplicity and economy.
Completely redesigned with streamlined dismountable valve assembly, and small dimension body. Patterns available for iron pipe, copper tube and Bundy tube connections.
Interchangeable models for coal gas and Butane burning appliances.
Dials available calibrated to B.S. 1250, calibrated in Fahrenheit or centigrade degrees and lower temperature ranges for water boilers. Colours to suit all schemes. Engraving for front or side mounting.
Fixed or variabl. by-pass.
TR. 536 Coal gas thermostats with straight through connections on body.
TR. 536B. Butane thermostats with straight through connections on body.
TR. 541. Coal gas thermostats with "U" type connections.
TR. 541B. Butane gas thermostats with "U" type connections.

Sperzom TRADE MARK

SPERRYN & CO. LTD.

MOORSOM STREET, BIRMINGHAM, 6. Telephone: ASTON CROSS 4011 (5 lines)

London Address: 23, Great Suffolk Street, S.E.1. Telephone: WATerloo 6418

GEORGE GLOVER & Co. Ltd.

DOMESTIC METERS
TEST METERS
INDUSTRIAL METERS
Product of Radiation Ltd

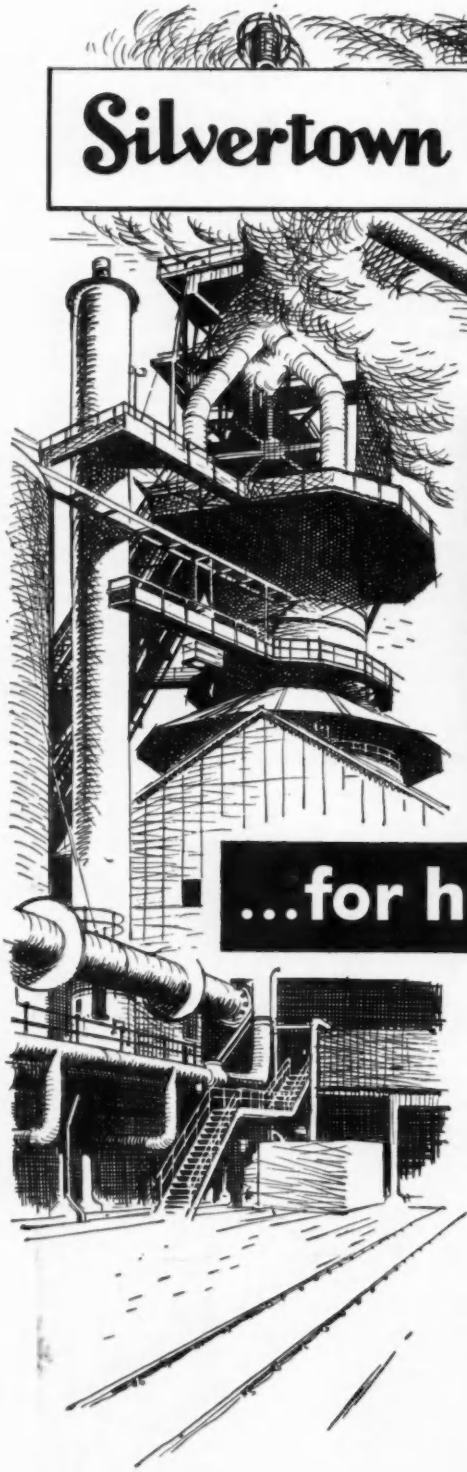
GAS METERS

122, KINGS RD. CHELSEA LONDON, S.W.3.

Branch works

WARRINGTON · LEEDS · MANCHESTER · CARDIFF.

Silvertown CONVEYOR BELTING



...for hot coke

Silvertown has vast experience in the making of conveyor belts for hot materials—such as hot castings, hot sand and hot cement clinker. But hot coke presents a special problem—its high degree of abrasiveness which, even more than its heat, can be so destructive of conveyor belting.

To meet this problem there is no better choice than Silvertown Grade Super A belting . . . a heat resistant belting of exceptional toughness which, for the conveyance of hot quenched coke in steel works and gas works, has proved itself unequalled for "life" and economy.

★ **If hot coke is wearing out *your* belts too quickly—specify Silvertown Grade Super A.**

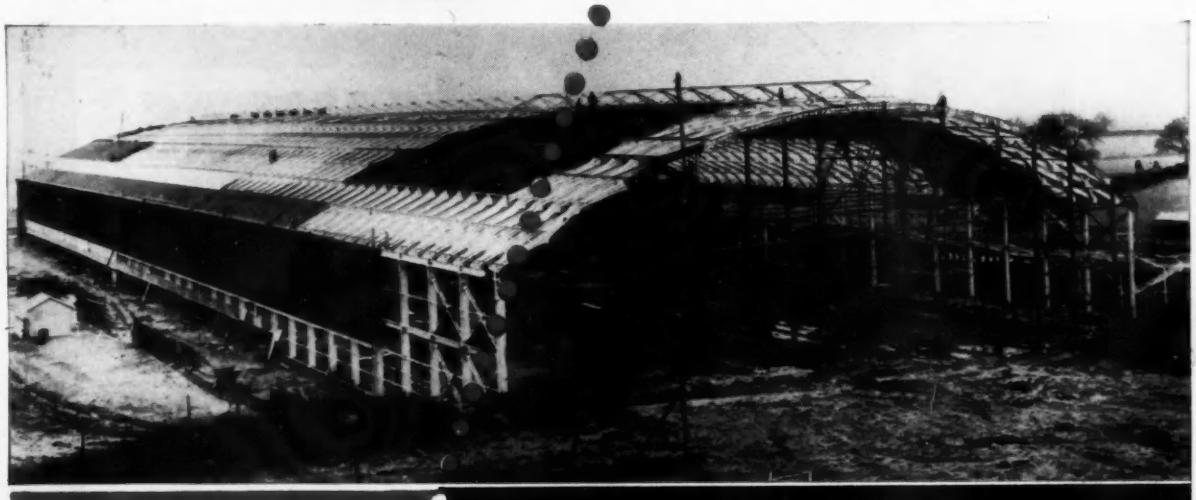
THE INDIA RUBBER, GUTTA PERCHA & TELEGRAPH WORKS CO. LTD
Herga House, Vincent Square, London S.W.1

D1038

Reflection and Protection

It's wonderful how ATLAS Aluminium Paints will keep a building bright, cheerful and well-preserved.

Their brilliant, reflective surface provides better lighting, thus reducing eyestrain and the risk of accidents. Used on external surfaces they reflect solar heat, keeping the accommodation beneath relatively cool in hot weather. ATLAS Aluminium Paints give splendid protection against corrosion and prove extremely durable. Send now for descriptive booklet entitled "Coat of Mail Protection."

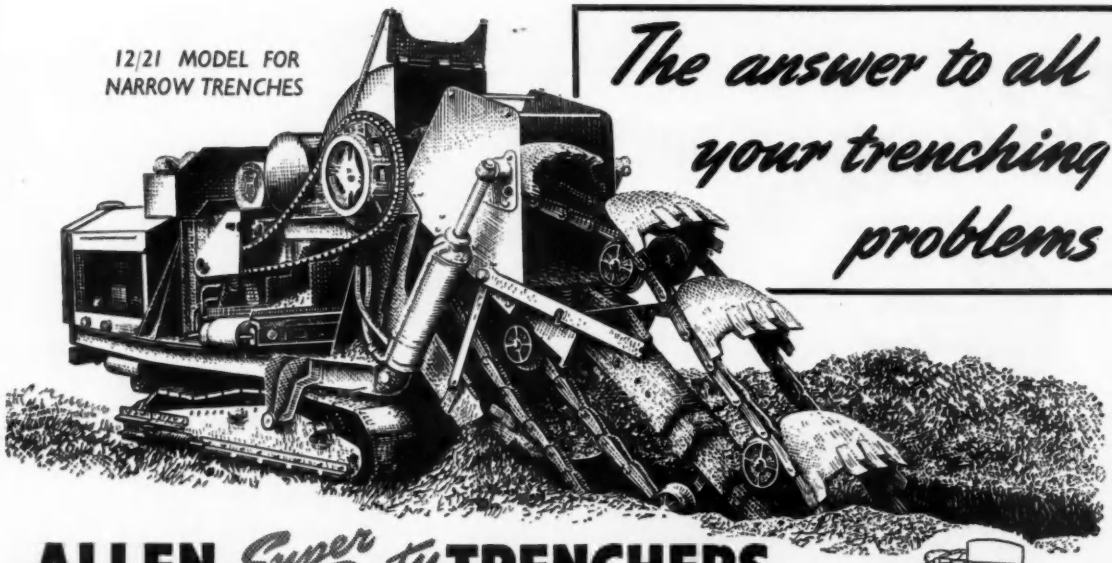


ATLAS Aluminium Paints

ATLAS PRESERVATIVE CO. LTD., ERITH, KENT · Telephone: ERITH 2255 (3 lines) Telegrams: Deoxydizer, Erith

TAS/AS 127

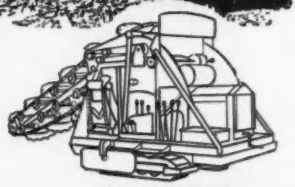
12/21 MODEL FOR NARROW TRENCHES



The answer to all your trenching problems

ALLEN *Super Duty* TRENCHERS

For narrow trenches we supply the 12/21 model, and for wide trenches the 16/60 model. Both models are a fine engineering job and capable of standing up to continuous hard work. We shall be pleased to send you further information and fully illustrated brochures on request.



16/60 TRENCHER

JOHN ALLEN & SONS (OXFORD) LTD. COWLEY OXFORD *Tel 77155/6/7*

JEAVONS

HIGH PRESSURE SERVICE GOVERNORS

Acclaimed by the Gas Industry over the past 20 years and still unsurpassed for reliability and ease of maintenance.

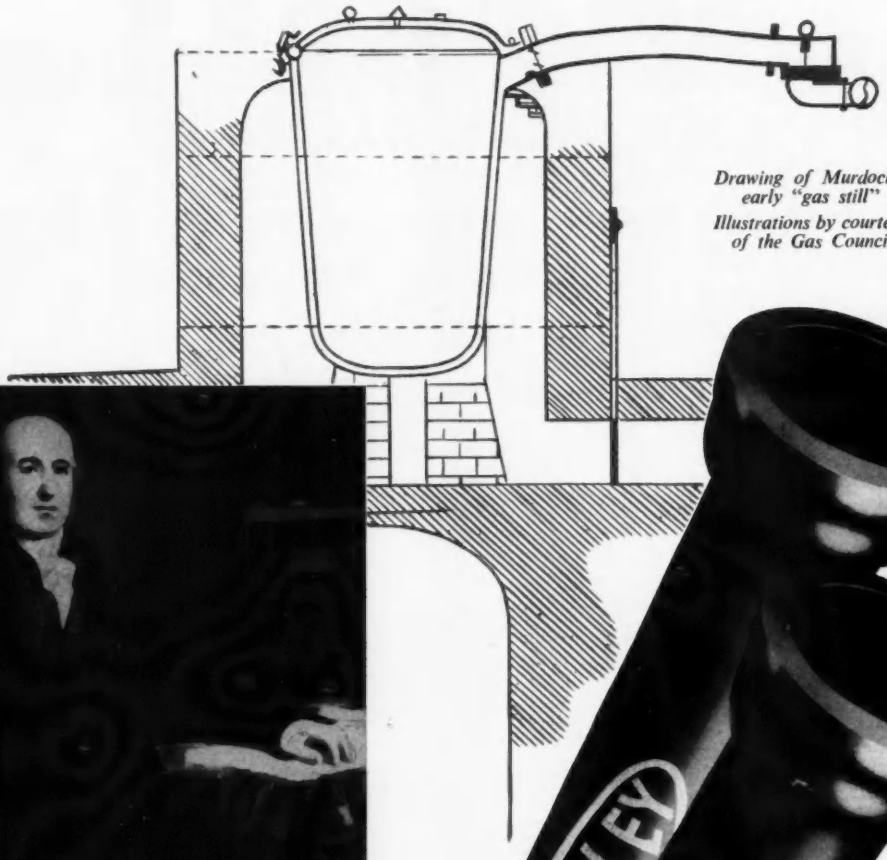
Ask for Brochure 48/10/SG.

JEAVONS ENGINEERING CO • TIPTON • STAFFS

PROPRIETORS • E.E. JEAVONS & CO. LTD

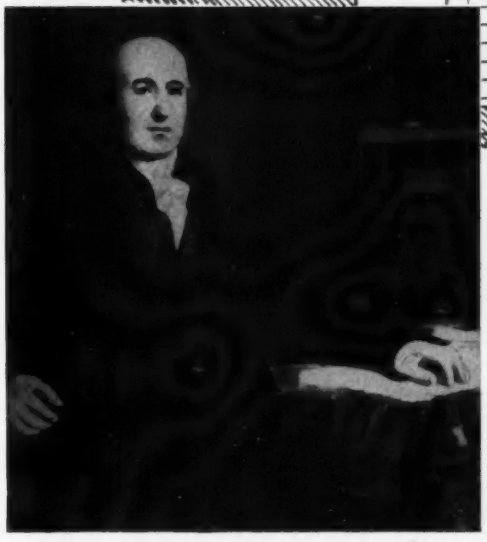
Grams "PIPELINES" Phone TIP-2161 (5 lines)

The Vital Flame of Progress



Drawing of Murdock's early "gas still"

Illustrations by courtesy of the Gas Council



WILLIAM MURDOCK 1754 - 1839

Undoubtedly the "inventor of Gas lighting" and his work on the distillation of gas from coal and the practical use of that gas dominated the "gas industry" during the last 50 years of his lifetime.

For many years Staveley pipes have been recognised the world over as of the highest attainable standard for Gas mains.

SAND and METAL SPUN PIPES FOR GAS

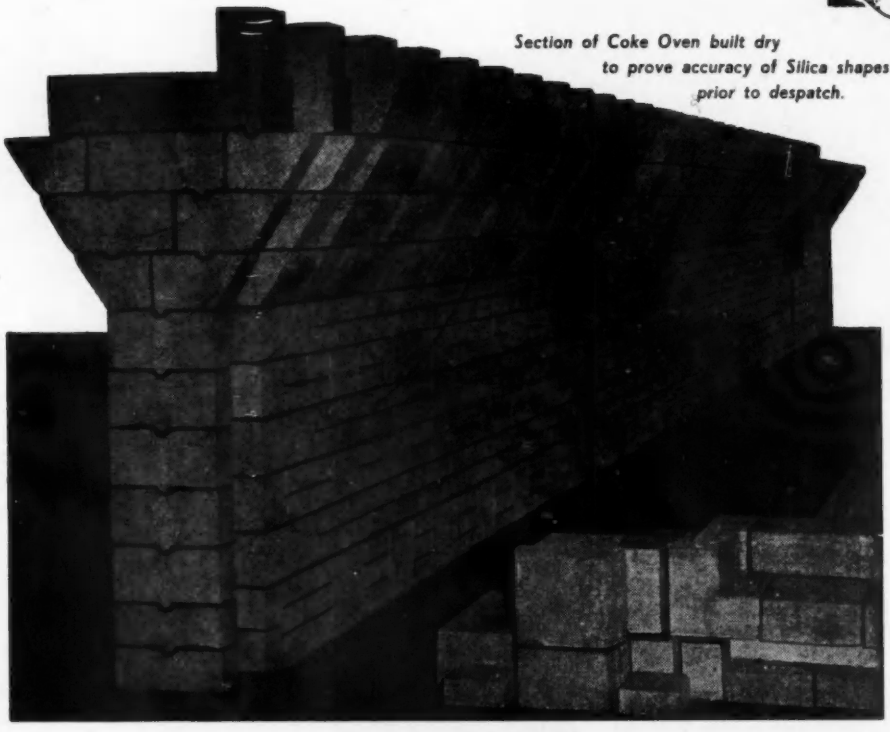
THE STAVELEY IRON & CHEMICAL CO. LTD. NR. CHESTERFIELD

CONSETT

HIGH GRADE REFRACTORIES FOR COKE OVENS, GAS WORKS, ETC.

SILICA BRICKS, SHAPES and CEMENTS
SPECIAL NON-SPALLING HIGH-ALUMINA MATERIALS FOR DOOR JAMBS and BOTTOM SECTIONS OF VERTICAL RETORTS

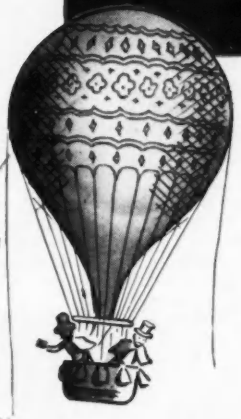
Our Technical Department is always available for consultations on recent developments.



Section of Coke Oven built dry to prove accuracy of Silica shapes prior to despatch.

IT PAYS TO USE CONSETT REFRACTORIES

CONSETT IRON COMPANY LIMITED
CONSETT · CO. DURHAM · ENGLAND
TELEPHONE: CONSETT 341 (10 LINES) TELEGRAMS: STEEL, PHONE, CONSETT



WE ALL DEPEND ON GAS

Simple and robust construction, precise manufacture to carefully selected tolerances and strict concentricity throughout. The generated tooth-form gearing and essential working parts are totally enclosed in a grease-filled gearbox designed to ensure free operation. Care has been taken to prevent the possibility of corrosion and foreign matter affecting the mechanism over long periods under adverse working conditions.

George Wilson Gas Meters Ltd.,

COVENTRY · JARROW · LONDON · MANCHESTER · WOLVERHAMPTON · GLASGOW

Ⓚ MALLEABLE TUBE FITTINGS ARE ...

Specify British Ⓚ Brand Malleable Fittings and you are not only doing your share in keeping money in Britain and helping to maintain full employment, but you are also guaranteed high quality, individually tested, malleable tube fittings to British Standard dimensions.

-AS BRITISH AS THE FLAG

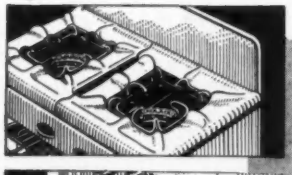
KIRK'S other Products include:
Flanges.
Flanged Fittings.
Fabricated Pipework.
Welded Fittings.
Welded Seamless Steel Tubes & Fittings.
Malleable Iron Castings.
Drop Forgings.
Valves.

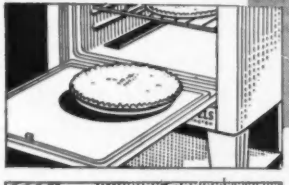
BUY BRITISH—BUY FROM KIRK'S

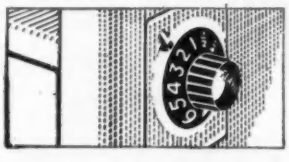
KIRK & COMPANY (TUBES) LTD

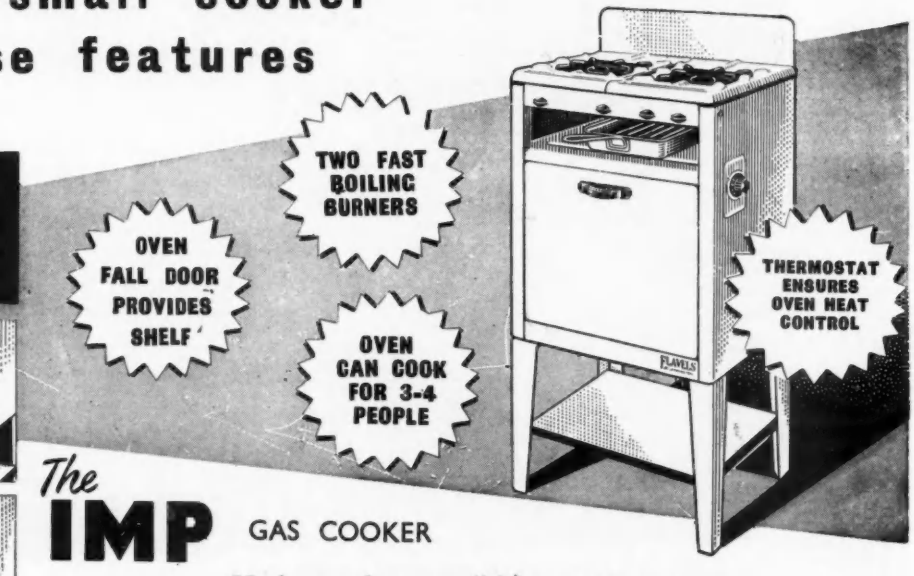
74/82 PARADISE STREET, LONDON, S.E.16 BERmondsey 3156/7/8 and 3150
also at WALSALL · MANCHESTER · PONTYCLUN

The only small cooker with these features








TWO FAST BOILING BURNERS
OVEN FALL DOOR PROVIDES SHELF
OVEN CAN COOK FOR 3-4 PEOPLE
THERMOSTAT ENSURES OVEN HEAT CONTROL
FLAVELS

The IMP GAS COOKER

Under modern conditions many young couples live in strictly limited accommodations, where only a small cooker can be used.

Designed specially for small flats, and maisonettes the Imp is a good selling line with a large potential market.

FLAVELS of LEAMINGTON

Makers of fine cooking and heating appliances since 1777.

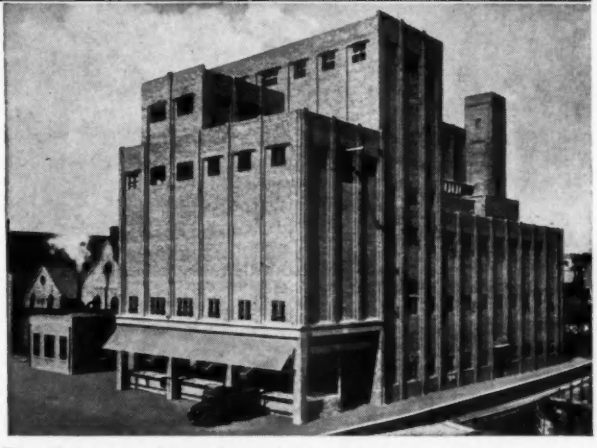
Telephone: Leamington 100 (Head Office) 3091/2 (Sales). Telegrams: FLAVELS.

ILLUSTRATED above you will see the main Ironclad Switchboard comprising a combination of oil immersed, vertical isolation switchgear of our OS.22 pattern and ironclad switch fuse units. The first two panels of the Switchboard each control one 156·25 kVA Alternator, synchronising equipment being provided on a swinging bracket for synchronising the two alternators, Panels 3, 4, 5 and 6 being outgoing feeder panels.

Separately mounted in front of the main Switchboard are two exciter cubicles on which are mounted automatic voltage regulators and hand field regulator equipment.

This Switchboard was supplied to the order of Woodall-Duckham Construction Company Ltd., and is one of many that we have supplied for controlling the electrical power of Gas Works throughout the world.

MAY WE HAVE YOUR ENQUIRIES?



The illustration above shows the exterior view of the Jersey Gas Works, at St. Helier.

ERSKINE, HEAP & Co LTD

Switchgear Specialists

LANCASHIRE SWITCHGEAR WORKS, MANCHESTER, 7
London Office: GRAND BUILDINGS, TRAFALGAR SQ., W.C. 2
BRANCH OFFICES AND AGENCIES IN ALL PARTS OF THE WORLD

SCIENTIFIC LUBRICATION

for the GAS INDUSTRY

Long years of experience enable us to offer a complete range of lubricants of the highest quality.

TECHNICAL SERVICES INCLUDE:—

Comprehensive Lubrication Surveys by Expert Lubrication Engineers and Chemists—without obligation.

Contracts on a Thermal Output Basis are available
Consult the leading suppliers to the Industry

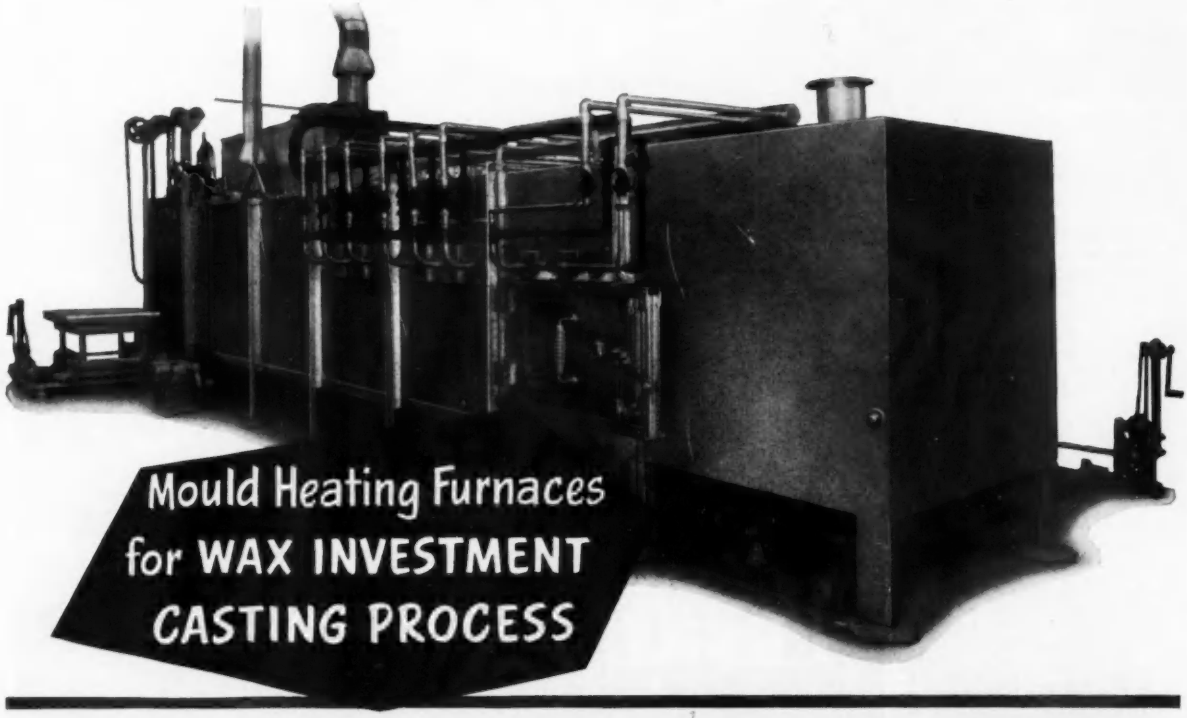
CENTURY LUBRICANTS

WILLIAM WALKER & SONS (HANLEY) LTD.
CENTURY WORKS · HANLEY · STAFFS.

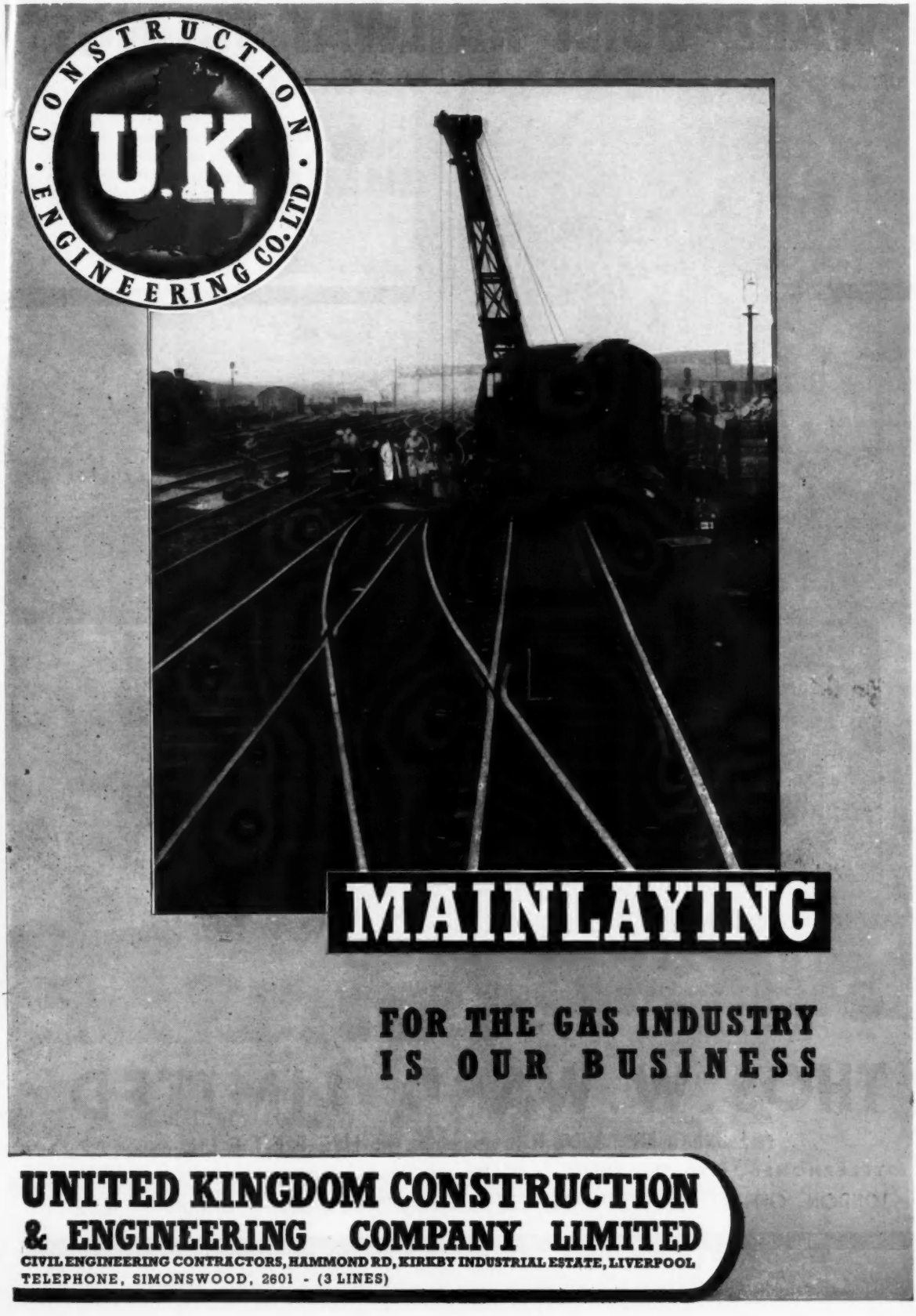
Telephone: Stoke-on-Trent 25203 (4 lines) *Telegrams:* Viscosity, Stoke-on-Trent

BRANCHES IN ALL PARTS OF THE COUNTRY

Contractors to the British Government, Crown Colonies, British Railways, National Coal Board, Area Gas Boards, Road Transport Executive, &c.



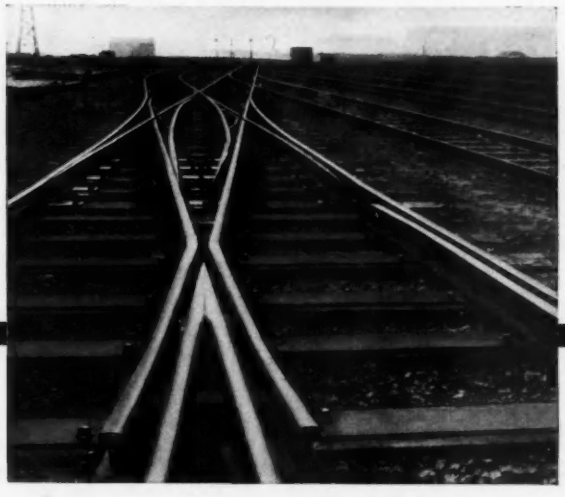
FRANKLIN FURNACE CO. LTD. BAKER STREET BIRMINGHAM 11.


CONSTRUCTION
U.K
ENGINEERING CO. LTD.
MAINLAYING
FOR THE GAS INDUSTRY
IS OUR BUSINESS
UNITED KINGDOM CONSTRUCTION
& ENGINEERING COMPANY LIMITED
CIVIL ENGINEERING CONTRACTORS, HAMMOND RD, KIRKBY INDUSTRIAL ESTATE, LIVERPOOL
TELEPHONE, SIMONSWOOD, 2601 - (3 LINES)

WARD-BUILT RAILWAY SIDINGS

Backed by the experience of over half a century, Wards' service to industry covers all aspects of railway siding planning, construction and maintenance, including earth moving and site preparation.

Photographs of recent 'Ward-built' sidings, at (above Dorman Long & Co. Ltd.'s new blast furnace at Clay Lane, Middlesbrough; (left) Point of Ayr Colliery (reproduced by permission of the N.C.B.) and (below) Dorman Long & Co. Ltd., Lackenby Steel plant, Middlesbrough.



The third edition of our booklet 'Rails and Rail Accessories' is now available. Copies will be forwarded on request.

THOS. W. WARD LIMITED

ALBION WORKS · SHEFFIELD

TELEPHONE: 26311 (22 LINES) · TELEGRAMS: "FORWARD · SHEFFIELD"

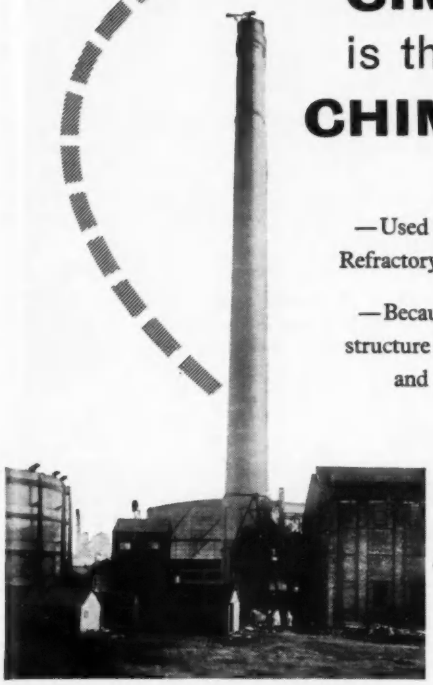
LONDON OFFICE: BRETTENHAM HOUSE · LANCASTER PLACE · STRAND · W.C.2

SC.35.

CIMENT FONDU
is the Ideal Cement for
CHIMNEY LININGS

—Used according to temperature conditions with Refractory, Insulating or Non-Refractory aggregates.

—Because it protects the steel, brick or concrete structure against attack by heat and by the acidity and sulphates from the combustion gases.



Wallasey Power Station. Ciment Fondu mortar was used for the jointing of the interior brickwork of this chimney.

Shell's Shellhaven Refinery, Essex. These 9 ft. diameter steel stacks have been lined with Ciment Fondu insulating concrete.

Battersea Power Station where chimneys have been lined with Ciment Fondu mortar.

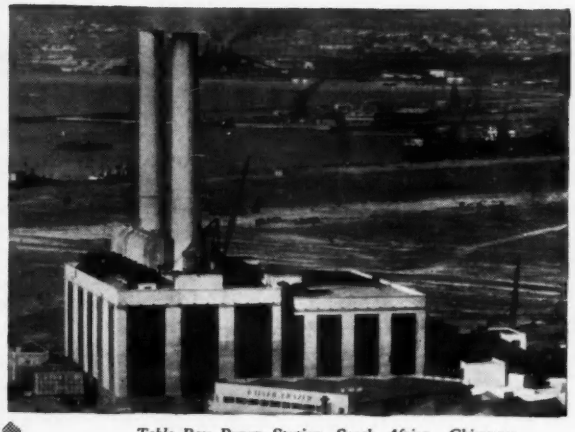


Table Bay Power Station, South Africa. Chimneys gunited with Ciment Fondu mortar.

REFRACTORY CONCRETE
The adaptable Refractory material made with crushed firebrick and CIMENT FONDU

CIMENT FONDU
Regd. Trade Mark
ALUMINOUS CEMENT

CONCRETE ROCK-HARD WITHIN ONE DAY

Ciment Fondu is manufactured by

LAFARGE ALUMINOUS CEMENT COMPANY LIMITED

73 BROOK STREET, LONDON, W.1. Telephone: MAYfair 8546

You are invited to write for further details and photographic examples

AP 3-1308

Steel Bunkers and Chimneys at Power Stations and Works are usually lined with GUNITE which withstands abrasion and chemical attack without adding seriously to the weight.

GUNITE

puts longer life into Bunkers

The Gunite process, developed by the Cementation Co., Ltd., has a successful record of over 25 years as a facing for both new and dilapidated structures.

It is water, weather, and fireproof, and has great mechanical strength and hardness. Its adhesion to concrete is greater than the strength of the concrete itself.

Write for your copy of the Gunite booklet which illustrates and describes its characteristics and applications for factories, chimneys, wharves, water towers, reservoirs, sea walls, silos, etc.

The CEMENTATION COMPANY LIMITED

BENTLEY WORKS, DONCASTER
Tel. 54177-8-9

London office: 39, Victoria Street, S.W.1.
Tel. ABBey 5726

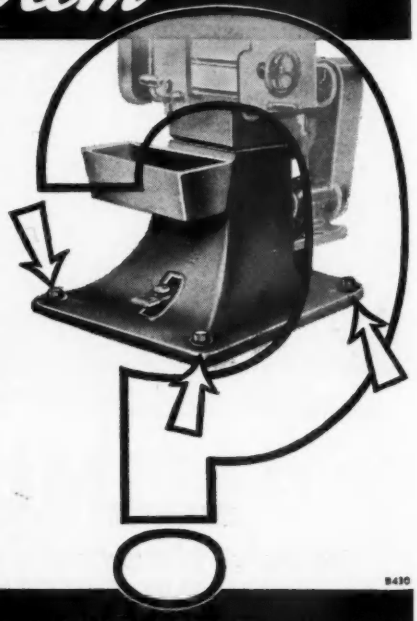
Have you a Fixing Problem

For many years our Technical Dept. has been engaged in research on every kind of fixing problem, in every kind of material. This department will gladly solve your fixing problem free. Just write and send us details.

HEAVY FIXINGS Machines and plant are safely bolted down, by using Rawlbolts, in a fraction of the time taken by old methods. With Rawlbolts there's no grouting in, no waiting for cement to set. Rawlbolts grip by expansion — *the tighter the bolt the better the grip.* For wet conditions, and for resistance to heavy and fluctuating loads, use Rawlplug Bolt Anchors — fixings of immense strength, easily caulked when fixing.

SCREW FIXINGS For absolutely firm screw fixings in hard materials Rawlplugs are several times quicker and very much neater than the old fashioned big hole and wood plug method. A Rawldrill makes a clean hole, exact to size; insert a Rawlplug, then turn home the screw. There's a Rawlplug for every size of screw up to 1" diam. coach screw.

CAVITY FIXINGS For thin and hollow materials, wall boards, cavity bricks, etc. Among these remarkable Rawlplug devices are—Spring and Gravity Toggles; the Rawlanchor, which enables you to make permanent tapped fixings in a wall board of which the back is inaccessible, and the Rawlnut (shown left), which actually forms its own rivet head at the back as you screw in front.



B430

RAWLPLUGS HAVE THE ANSWER!

THE RAWLPLUG COMPANY LIMITED · CROMWELL ROAD · LONDON · SW7

Too many cooks . . .

Only when cooks are divided amongst themselves in their aims, and being active in contrary directions, can this proverb be truly applied.

Accuracy and singleness of purpose, with co-ordination of effort, must surely constitute the recipe which spells a successful result.

Oxley's teams of designers, estimators, fabricators, erectors and testers (including "X" and "Gamma" Ray) all form a coherent whole, producing structures—whether Gas Holders, Purifiers, Chemical Plant, Elevators, Skip Hoists, Fabricated Steel Pipes, Tar Stills or Hoppers—which are recognised as products which provide satisfaction alike to user and manufacturer.

OXLEY

OXLEY ENGINEERING CO. LTD., HUNSLET, LEEDS 10

Telephone: Leeds 32521
Telegrams: Oxbros, Leeds 10

London Office: WINCHESTER HOUSE, OLD BROAD STREET, E.C.2.
Telephone: London Wall 3731 *Telegrams:* Aspengpro, Stock, London

W.153

I.C.I. Copper tubes for trouble-free Gas Systems

For domestic gas systems, light gauge copper tubes made by the Metals Division of I.C.I. have five obvious advantages. They are:—

1 **Economical, both in laying costs and maintenance.**

2 **Not attacked by normal town gas.**

3 **Easily manipulated and installed.**

4 **Strong in relation to their light weight.**

5 **Neat in appearance.**

Whatever the building—farmhouse or factory; house, hotel or hospital—the job is better done with I.C.I. copper tubes.

IMPERIAL CHEMICAL INDUSTRIES LTD LONDON SW1

Fittings for copper tubes are made by Fyffe & Co. Ltd., Dundee, a subsidiary company of I.C.I.

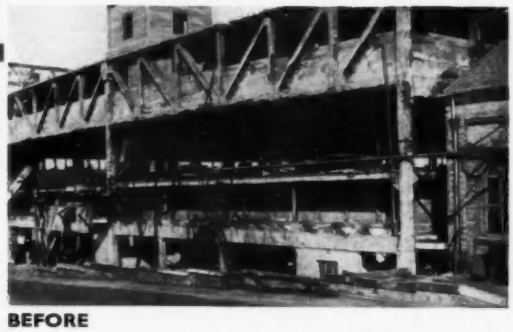
M.204

Before rebuilding or replacing

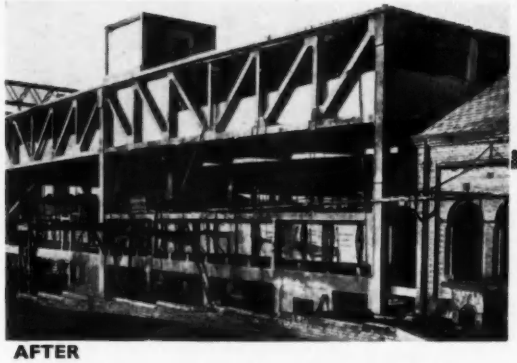
Consider

GUNITE

The reconditioning process that makes veteran installations as good as new — **often better**



BEFORE



AFTER

Reinforced Concrete gas purifier structure repaired throughout by the Gunite process without interference with production, for The North Western Gas Board, Bolton-Radcliffe Group. Write for descriptive literature to:—

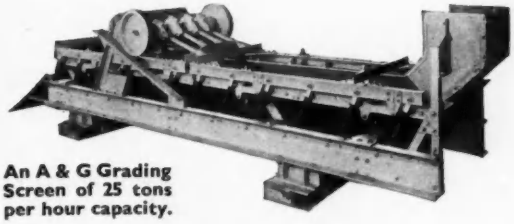
WHITLEY MORAN

AND COMPANY LIMITED

Specialists in the repair of Engineering Structures.
5, OLD HALL STREET, LIVERPOOL 3
Phone: GENtral 7975. Grams: Gunite, Liverpool 3.

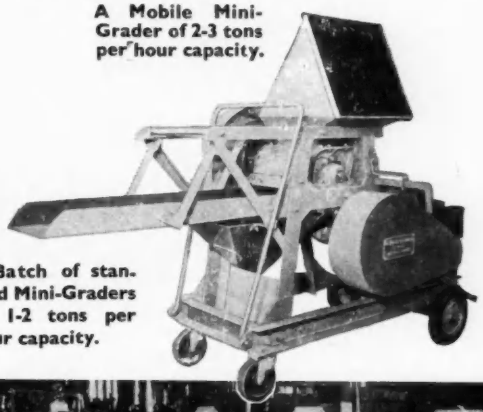
SCREENS

Made in the "Mini-Grader" Range up to 5 tons per hour and in the A & G and Standard range up to 50 tons per hour capacities.

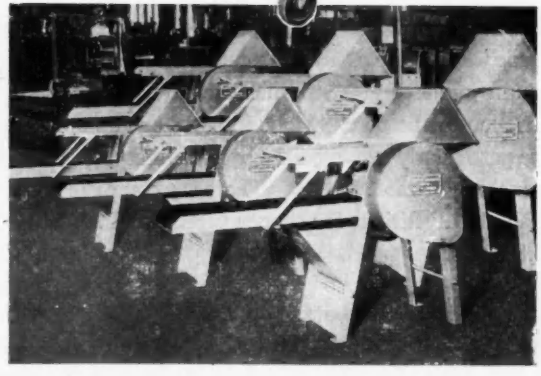


An A & G Grading Screen of 25 tons per hour capacity.

A Mobile Mini-Grader of 2-3 tons per hour capacity.



A Batch of standard Mini-Graders of 1-2 tons per hour capacity.



ALDRIDGE & RANKEN LIMITED

AVONBANK WORKS, BATH

Tel.: 2936 & 5711

the last word in gas installations

B

No trouble at all

Fyffe's 'CONEOR' manipulative compression fittings, made with a simple flaring operation on the tube, provide sound joints of great mechanical strength with no restriction of the bore. Made in brass or gunmetal, they are particularly suitable for underground services laid by trenching or mole plough. There is a complete range of 'CONEOR' fittings for copper tubing to B.S. 659 and B.S. 1386.

ALSO

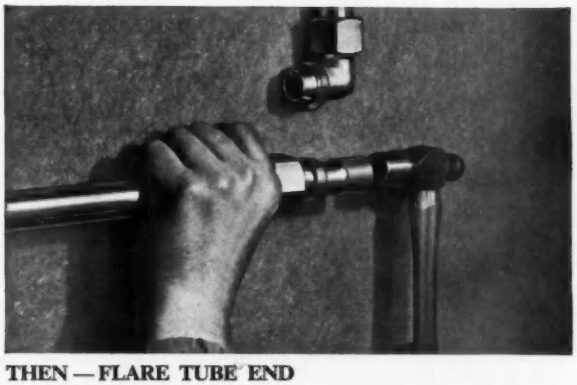
Fyffe's 'INSTANTOR'

—the non-manipulative fitting with the double-interlocking grip, for both copper and plastic tubing.

Fyffe's 'INTEX' P.T.

—the neat, strong, pre-tinned capillary fitting for domestic water and gas services.

JUST—SLIP NUT AND RING OVER TUBE



THEN—FLARE TUBE END

AND—TIGHTEN UP

...a perfect joint with Fyffe's 'CONEOR' fittings

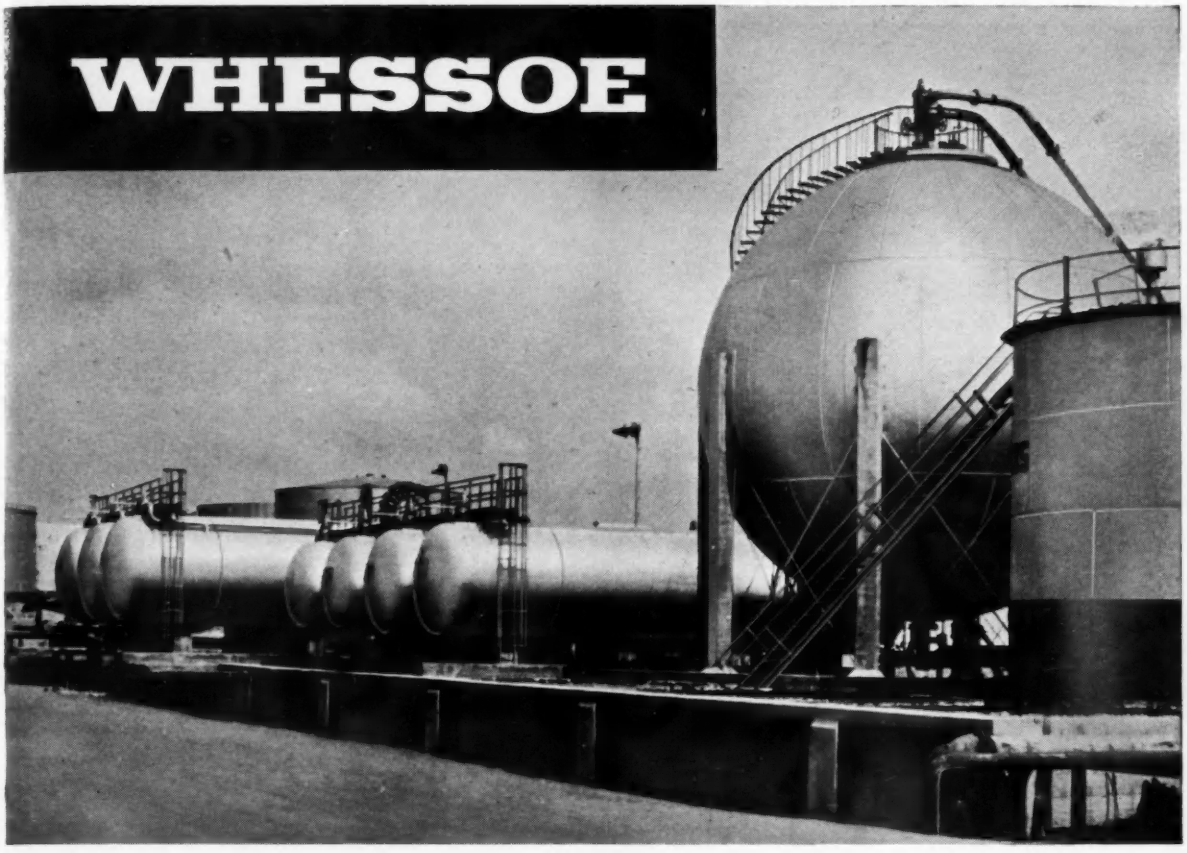
F24

FYFFE'S FITTINGS

trouble free to fit—trouble free in service

IMPERIAL CHEMICAL INDUSTRIES LIMITED, LONDON, S.W.I

WHESSOE



Propane and Butane Storage

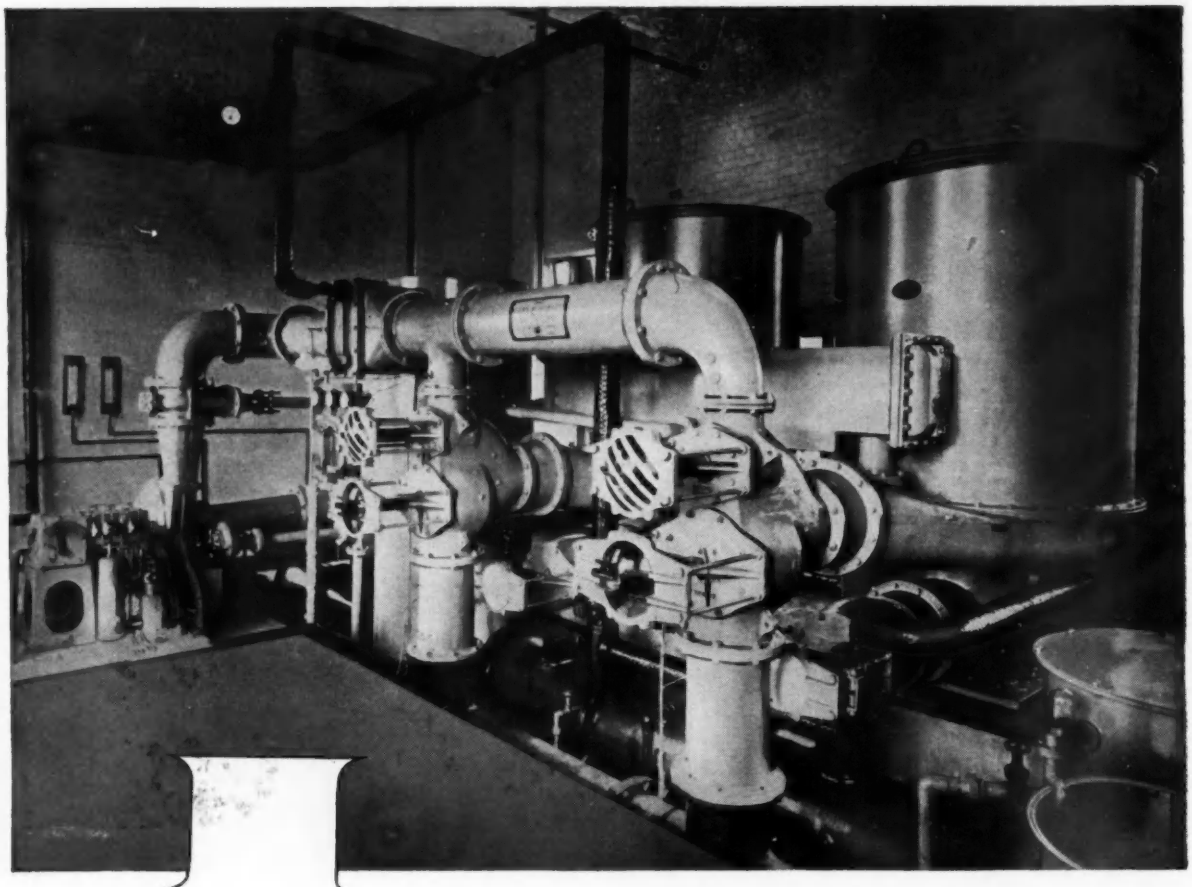
Storage tanks for liquid petroleum gases are supplied by Whessoe and range from large site-built cylinders and spheres for static storage, to standard containers of 5 and 1 ton capacity for transport or local storage purposes.

These vessels are manufactured to the appropriate code of construction (including X-ray and stress-relief when required) and supplied with all necessary fittings.

WHESSOE *FOR LIQUID GAS STORAGE*

AN ADVERTISEMENT OF WHESSOE LTD · DARLINGTON · TEL 5315 · LONDON OFFICE 25 VICTORIA ST. LONDON SW1 · TEL ABBey 3881

W60



100% recovery of Benzole

HAS BEEN RECORDED

100% recovery of Benzole has been recorded in the Gas Industry where Sutcliffe Speakman plants of the type illustrated are already installed.

These recovery plants are the result of over twenty years' experience in the manufacture and industrial use of Active Carbon. Their capacities range from 250,000 cu. ft. per day. Entirely automatic and with few moving parts, they are compact, clean in operation, and economical to run. Their initial cost, too, compares favourably with that of other recovery systems. In every way they are the most profitable investments. We are always ready to draw up a complete balance sheet for Benzole recovery in any specific undertaking of the Gas Industry.

to cut Benzole wastage to a minimum, consult

SUTCLIFFE SPEAKMAN

SUTCLIFFE SPEAKMAN AND COMPANY LIMITED, Leigh, Lancashire

Telephone: Leigh 94. London Office: 2 Caxton Street, Westminster, S.W.1. Telephone: ABBEY 3085

"Yorkshire"

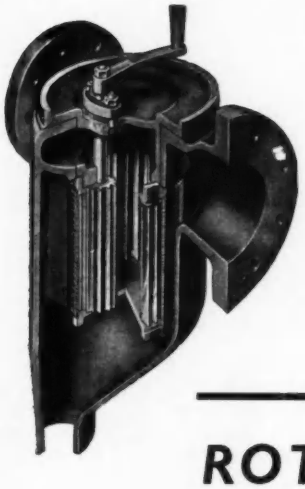
TUBES & FITTINGS

are used for the gas carcassing in the "Miller" Houses, Burgh of Barrhead

Plumbing Contractors: Robert Rome & Son, Limited, Rutherglen

Meter Connections by Scottish Gas Board, Barrhead District

THE YORKSHIRE COPPER WORKS LTD. · LEEDS & BARRHEAD



The Patented ROTOKLENE'S vee-section wire winding, offering minimum resistance to flow and instantly cleaned.

This self-cleaning strainer has many unique features which may be valuable in your business. It is widely employed by engine builders, shipbuilders and makers of oil-burning equipment, and has proved its efficiency over a long period.

ROTOKLENE self-cleaning STRAINERS

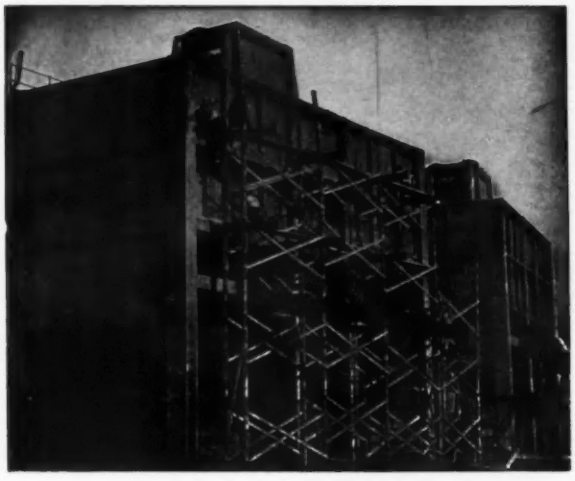
- *Unique cleaning method — extremely simple and reliable.*
- *Can be belt or motor-driven where constant cleaning is necessary.*

May we send you details of its novel and extremely effective principle of working?

ASHWORTH & PARKER Limited

RIVERSIDE WORKS · BURY · LANCASHIRE

Gunite



One of the reinforced concrete structures reconditioned with Gunite for the City of Carlisle Gas Undertaking.

Gunite—concrete applied by air pressure—has numerous applications where its great density and extreme adhesion have exceptional value.

For repairing reinforced concrete it has particular merit, as, due to the method of application, a uniform density and adherence is obtained whenever Gunite is applied.

For lining coal bunkers and steel chimneys it possesses great resistance to corrosion and protects steel-work from the abrasive action of coal or coke.

100, VICTORIA STREET, S.W.1
Telephone : Victoria 7877 & 6275

THE CONCRETE PROOFING CO., LTD.

Handbook "GUNITE" sent on request

National

CLASS 31
'DIRECT ENTRY'
ACCOUNTING MACHINES

for Payroll, Stores, Costing & Credit Sales Accounting

—without question the most efficient and highly developed machine of its kind in the world today. Your most critical investigation is earnestly invited. May we demonstrate?

For appointments to suit your convenience, kindly write or 'phone the **Accounting Machine Division of The National Cash Register Company Ltd., 206-216 Marylebone Road, London, N.W.1. PAD 7070**

949 OFFICES IN 94 COUNTRIES

The Sapphire '20' Balanced Flue Gas Space Heater is the result of British scientific research and development in the field of gas utilization.
Here is the complete answer to modern requirements of maximum efficiency; warm, fresh air, unpolluted by products of combustion, *plus* the highest possible safety factor.

Sapphire "20"
Registered Trade Mark Fully Patented

Full data upon request to Sole Licensees:—

COWPER PENFOLD & COMPANY LIMITED
Sole Distributors
WILLIAM SUGG & COMPANY LIMITED
VINCENT WORKS, REGENCY STREET, LONDON, S.W.1 Telephone VICtoria 3211

LINDIBOLT
REGISTERED SELF-HEADING BOLT TRADE MARK

PATENT SELF-HEADING BOLT

For repairs to plating etc., etc. where only ONE SIDE of the work is accessible.

FROM STOCK
in mild steel in eight sizes ¼"— 1" each in four lengths

CREATES ITS OWN HEAD

Is nearly as strong as an ordinary bolt of the same size.

Descriptive circular and samples, on request. Special sizes, also Lindibolts in non-ferrous at short notice.

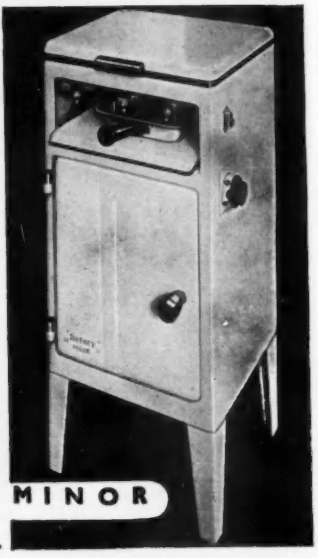
HENRY LINDSAY LTD.

P.O. Box No. 97
Mansfield Road, Bradford 8, Yorkshire
Telephone: Bradford 41384 (2 lines) *Telegrams: Lindsay Phone Bradford*
Makers of the Lindapter Patent Bolt Adapter

BIG Capacity for LITTLE Kitchens

Especially suited to the kitchens of flats and small houses, this highly efficient cooker provides utmost cooking capacity in the least possible space. Cast iron construction ensures strength and durability and reduces maintenance costs to a minimum, thus making the Dainty Minor particularly suitable for simple hire or hire purchase.

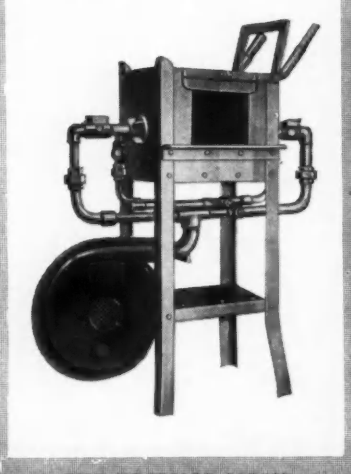
Approved and adopted by leading gas boards



The Dainty MINOR

R. RUSSELL & SONS, LTD., DERBY
Agents for Scotland and Northern Ireland:
JAMES R. THOMSON & CO. LTD., 41, YORK STREET, GLASGOW, C.2

BRITISH ALCOSA PRODUCTS



THE PREMIER NAME IN THE INDUSTRIAL GAS WORLD

GAS FIRED FORGES PATTERN B 2140

Made in 3 sizes by A. H. WILKES—the Premier name in the Industrial Gas World—this excellent Forge is specially designed for general workshop use for the heat treatment of pipes, angles and other similar articles of various shapes and lengths up to 24". The Furnace is fitted with hinged top and back doors for easy operation and fired by twin burners and can be supplied complete with fan units to supply the necessary air blast.

Ideally suited for Technical College instruction.

We invite you to write today for details of this Forge and other Industrial Gas Equipment.

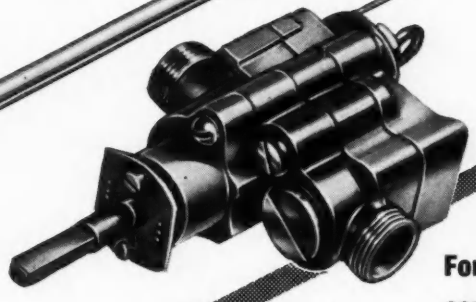
A.H.WILKES & CO.

A SUBSIDIARY OF WILLIAM ALLDAY & CO., LTD.
Head Office and Works :
"Alcosa" Works, Stourport-on-Severn, Worcestershire
Telephone : Stourport 311-4. Telegrams : Yadall, Stourport.

For FLEXIBILITY
...of mounting
...of application

THE TEDDINGTON Type 'TW'
Combined Thermostat and Gas Cock

has two outstanding advantages. First, that it can easily be mounted in positions most likely to give maximum efficiency. Secondly, it is suitable for use in a wide range of industrial and domestic gas-burning equipment and appliances, particularly where the sensing element must, of necessity, be located at some distance from the control point.



For direct temperature control of:—

COOKERS
PROCESSING OVENS
BOX DRYING OVENS
DRYING CABINETS
WARMING CUPBOARDS etc.

Temperature ranges between approximately 100°F. and 400°F. For full specification send for leaflet.

Teddington

THE BRITISH THERMOSTAT CO. LTD. SUNBURY-ON-THAMES, MIDDLESEX. Tel. Sunbury-on-Thames 456.

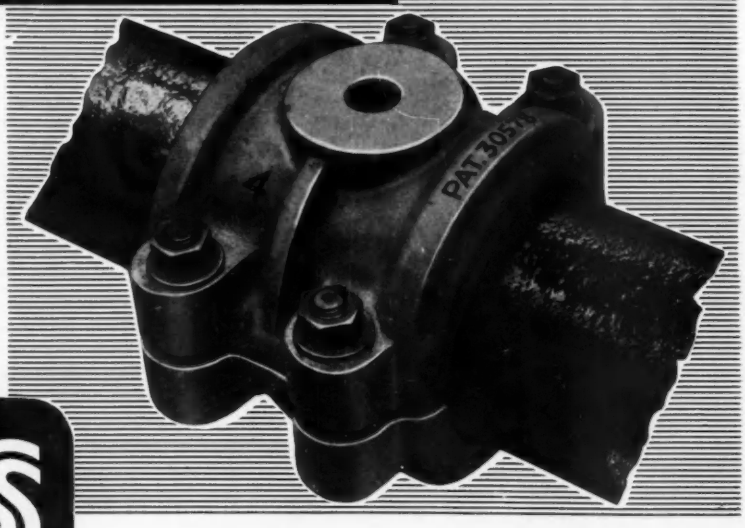
Leadless SPLIT COLLARS

Prov. Patent No. 30578/53

with PATENT SINGLE PIECE MOULDED RUBBER JOINT.

Pass Leadless Split Collars are light in weight and have no glands for adjustment. Fully tested up to 300 p.s.i. hydraulic pressure. Boss can be supplied tapped ½" to 2" B.S.P.

Send for further details.



PASS
GAS AND WATER ENGINEERS

E. PASS & CO. LTD., DENTON, MANCHESTER
Specialists IN UNDERPRESSURE ENGINEERING
Phone: DENTON 3001/2/3 Grams: TOOLS, DENTON, MANCHESTER

dmPA36

The HYDRA LITE **RANGE OF TANGYE JACKS**

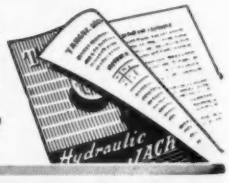
lift so easily

"Lightest Jack in the World"

Everybody concerned with lifting or displacing heavy weights should know about the advantages of the 'Hydralite' super lightweight jacks. The 15 tons capacity weighs only 24 lb. Normally, jacks in this higher tonnage range take two or more men to move them. A 'Hydralite' is easily lifted by one man and shows a saving in manpower and operator fatigue.

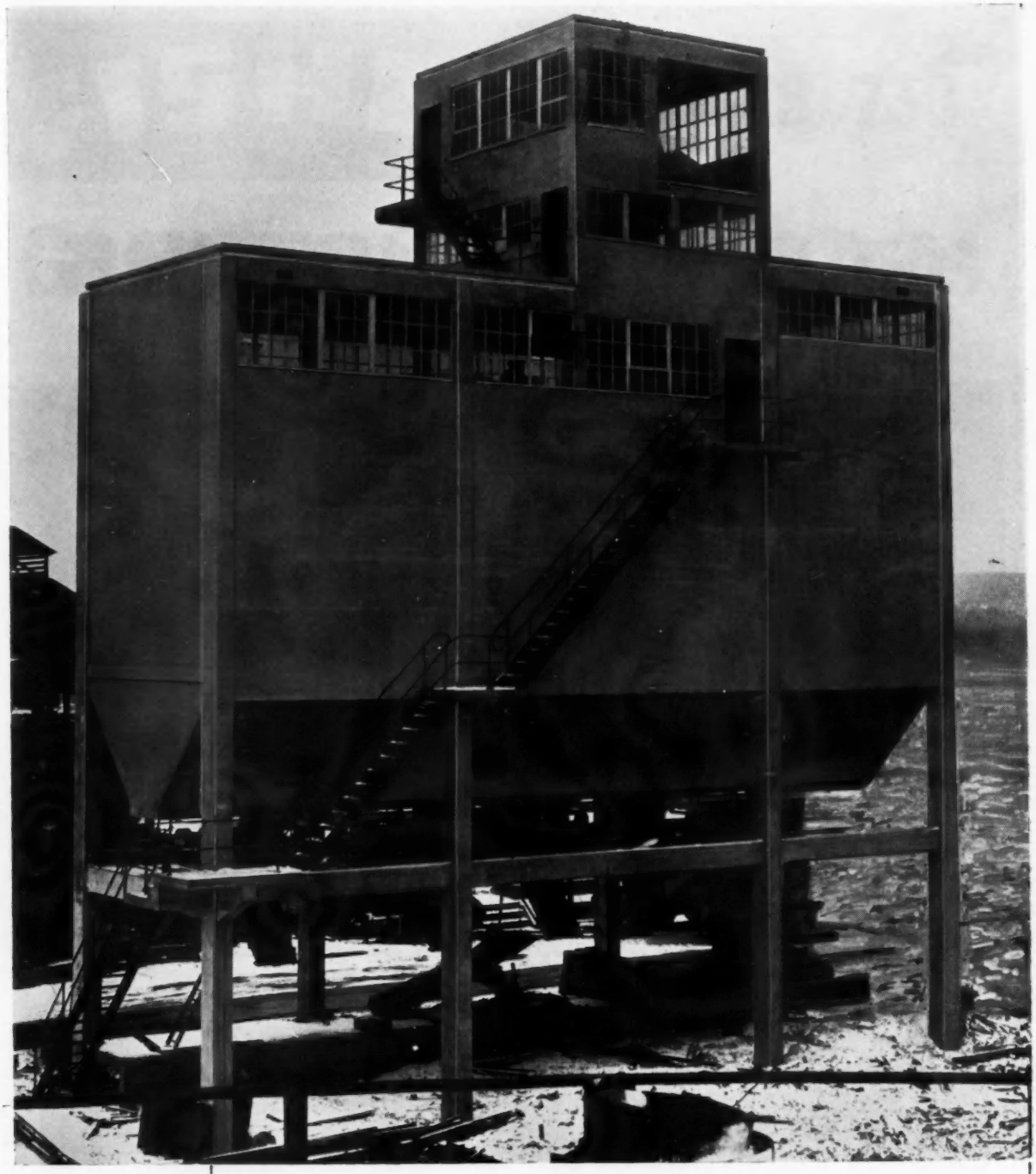
PARTICULARS OF THE 'HYDRALITE' RANGE

Model	Capacity (tons)	Weight (lb.)	Power Lift (in.)	Closed Height (in.)
6515	15	24	6·5	11·375
625	25	32	6	11·5
650	50	61	6	13
1215	15	38	12	18·25
1225	25	53	12	18·875



SEND TODAY FOR 'HYDRALITE' LIST
or for help on your hydraulic problems

TANGYE
HYDRAULIC **DIVISION**
BUILT ON A CENTURY OF HYDRAULIC EXPERIENCE
TANGYES LIMITED · SMETHWICK · BIRMINGHAM · ENGLAND



Consulting Engineers:
Messrs. Coignet and Partners

Main Contractors:
Messrs. Robt. Cort & Son, Ltd.

North Eastern Gas Board
(Dewsbury).

CROWLEY RUSSELL & CO. LTD.

CIVIL ENGINEERING CONTRACTORS

131, VICTORIA STREET, LONDON, S.W.1.

Telephone: **VIC. 7788**

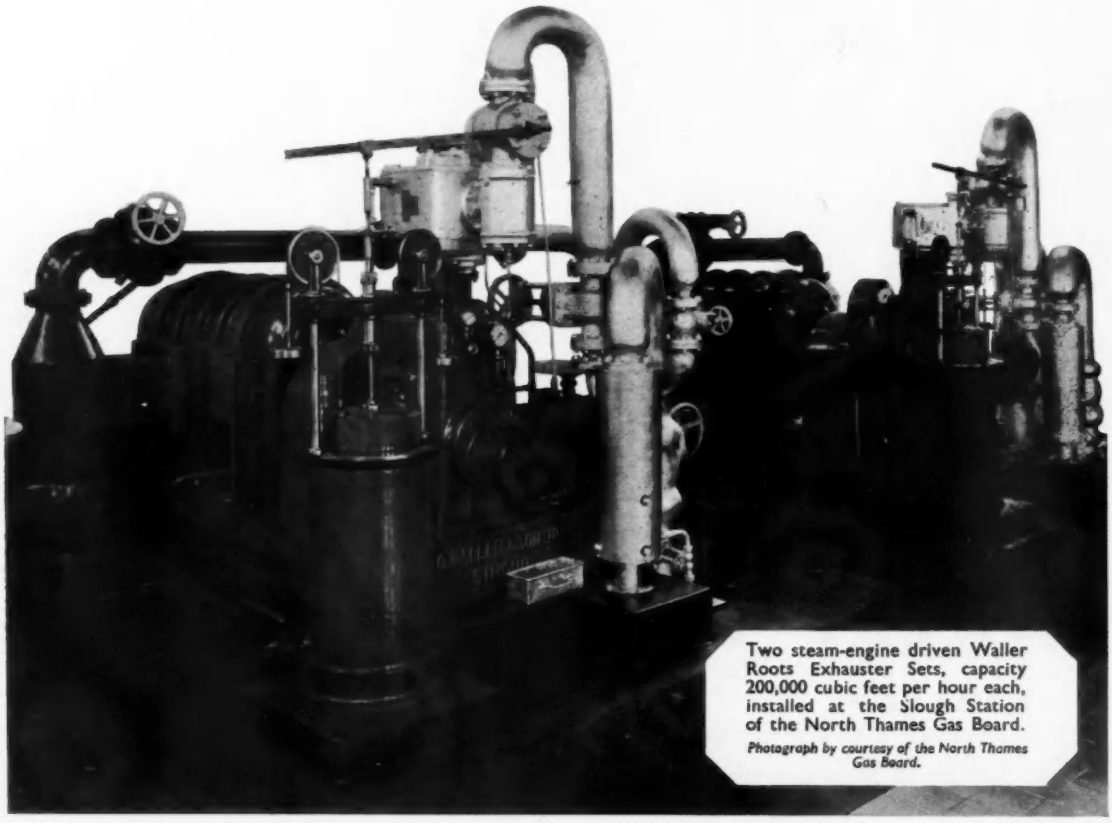
GAS EXHAUSTERS

GEORGE **WALLER** & SON LTD

PHOENIX IRON WORKS · STROUD · GLOS.

Telephone: BRIMSCOMBE 2301/2

MEMBER OF THE SOCIETY OF BRITISH GAS INDUSTRIES.

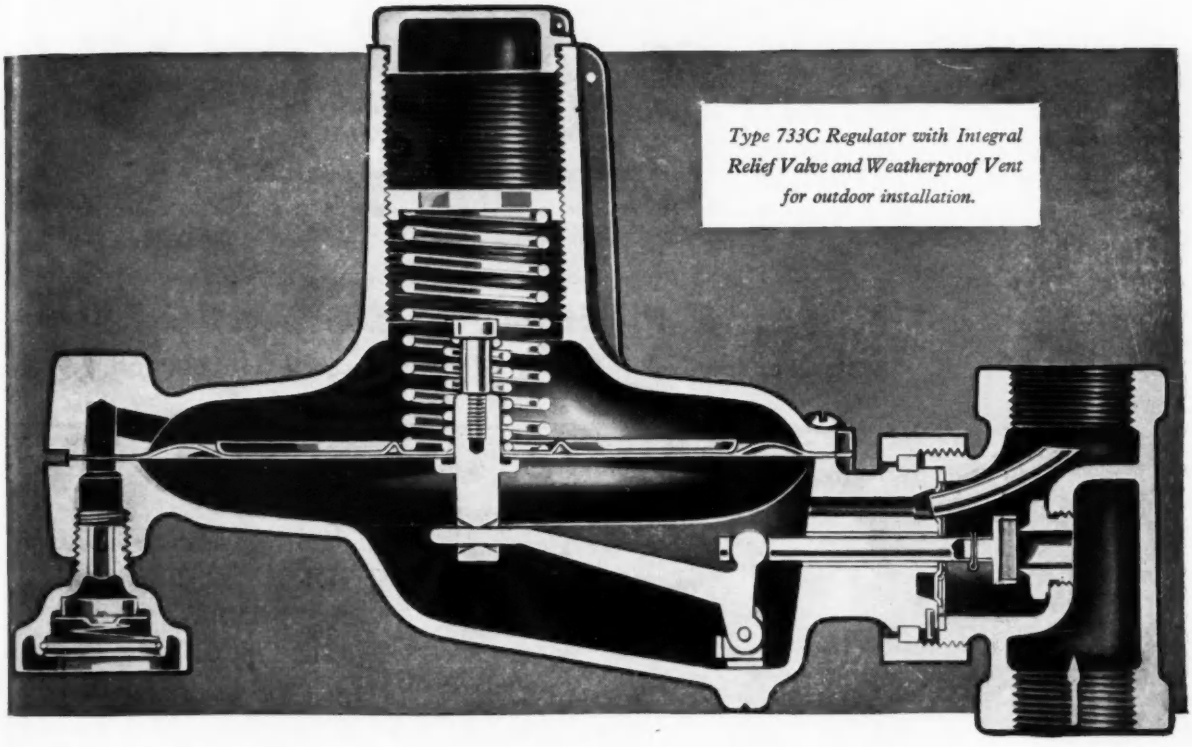


Two steam-engine driven Waller Roots Exhauster Sets, capacity 200,000 cubic feet per hour each, installed at the Slough Station of the North Thames Gas Board.

Photograph by courtesy of the North Thames Gas Board.

FISHER SERIES 730

Gas Service Regulators



Type 733C Regulator with Integral Relief Valve and Weatherproof Vent for outdoor installation.

Series 730 Regulators, in sizes from ¾" to 2", are employed to reduce gas pressures (up to 150 p.s.i.) to inches of water column in the outlet piping. Constant reduced pressure without droop at varying loads is ensured by the pitot tube in the outlet connection. Regulators may be fitted with integral relief valve to relieve excessive pressure build-up.

Catalogue FG20-GB, describing the range of Fisher Pressure Regulators now made in England, is available on request.

FISHER GOVERNOR COMPANY LIMITED,

CENTURY WORKS, LEWISHAM, LONDON, S.E.13 TELEPHONE: TIDEWAY 3232

MAPELTECTOR
Leak Detection System

MAIN LAYERS SAVE MONEY

Back fill as you lay and ensure more even consolidation of the trench and reduce watching, fencing, lighting and traffic control costs.

In the event of the air test not being within the tolerance EMPLOY OUR SYSTEM which covers the country and can locate the smallest leak without re-excavating, and at a fraction of the cost of other methods.

Further information will gladly be supplied on request.

MAPEL

METAL & PIPELINE ENDURANCE LTD.

4/24, Chandos Court, Caxton Street, Westminster, London, S.W.1

Telephone : ABBey 6056

You've proved the efficiency of the MONITROL AUTOMATIC SHUT-OFF VALVE for direct applications and use with relay valves.

NOW

HERE'S A FLAME FAILURE CONTROL WHICH WILL MAKE AND BREAK ELECTRICAL CIRCUITS.

This Thermo Electric Switch gives flame failure protection to gas appliances with electrically operated valves. It's a simple and efficient unit that will close magnetic valves, stop fans, blowers, etc., on flame failure. It will also operate alarms. It consists of a pilot burner and thermocouple which supplies current to an electro-magnet and operates two micro-switches. After shut-down current cannot pass again until the device has been manually reset.

MODEL No.
120 TE

Thermo Electric Switch

A member of the Parkinson & Cowan Group.

For full details of this new device and its many applications, send this coupon for a descriptive leaflet.

NAME_____

ADDRESS_____

MONITOR ENGINEERING & OIL APPLIANCES LTD., BIRMINGHAM, 33.

RUSTODIAN GOES ON NEW GALVANIZING

—and stays there!

This rust inhibiting lead paint can be used on new galvanized iron and steel without previous treatment. No need for a dilute acid etch or a wait of six months or so for the surface to weather — just wash down with white spirit to remove grease, then paint the sheets, window frames, etc. as soon as they are in position. Rustodian adheres perfectly and dries in six to eight hours. The Calcium Plumbate in Rustodian is one of the most powerful rust inhibitors known. It ensures very firm adhesion of the paint and provides a suitable surface for any further coats of decorative paint. It is a particularly good paint for seaside work.

Further particulars and colour card on request. Please write to any of our addresses.

ASSOCIATED LEAD * *Associated Lead Manufacturers Limited is a single Company which specialises in the manufacture of Lead Pigments and Lead Paints.*

IBEX HOUSE, MINORIES, LONDON, E.C.3
CRESCENT HOUSE, NEWCASTLE
LEAD WORKS LANE, CHESTER

ASSOCIATED LEAD PRODUCTS

EXPORT ENQUIRIES: THE ASSOCIATED LEAD MANUFACTURERS EXPORT CO. LTD., IBEX HOUSE, MINORIES, LONDON, E.C.3

EDWARD THOMPSON LIMITED

CIVIL ENGINEERING CONTRACTORS

Head Office:

GRANGE STREET · DERBY

Phone: Derby 47081/2

Branch Office:

EAST ANGLIAN BRANCH

EYE · SUFFOLK

Phone: Eye 349

Accuracy — at a glance

DIAL THERMOMETERS, CONTROLLERS and RECORDERS

Our range includes instruments particularly suitable for :

TURBINE BEARINGS
CONDENSERS
WASHER-COOLERS
PRODUCER GAS SETS
ETC. ETC.

BI-METAL · MERCURY-IN-STEEL · VAPOUR PRESSURE

New catalogues now available

Rototherm

DIAL THERMOMETERS

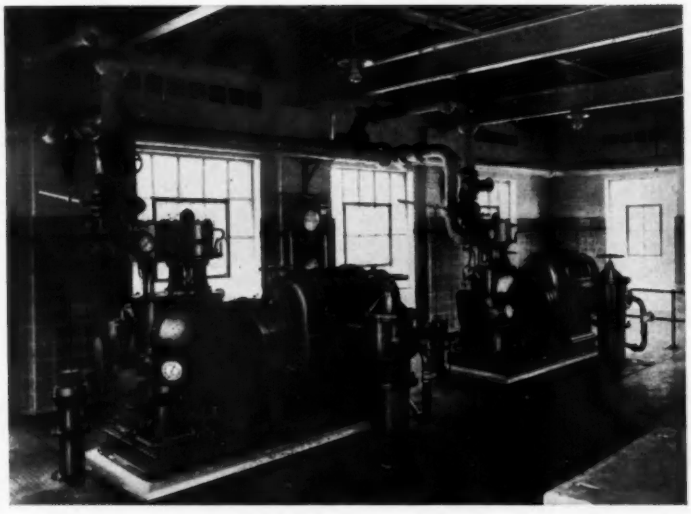
THE BRITISH ROTOTHERM CO., LTD.

Merton Abbey, London, S.W.19. LIBerty 7661.

SISSON STEAM ENGINES

FOR LONG PERIOD CONTINUOUS RUNNING

DESIGNED for driving EXHAUSTERS BOOSTERS COMPRESSORS ETC.



COMPACT STURDY and RELIABLE

SUITABLE for GAS GOVERNOR or AUTOMATIC CONTROL

Telegrams: SISSON

W. SISSON & CO., LTD.

GLOUCESTER, ENGLAND.

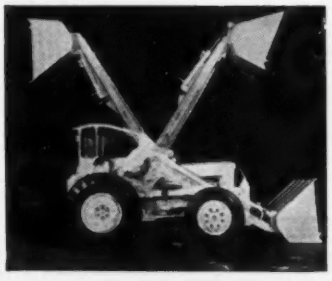
Telephone: 22295-6

BRAY

HYDRALOADER

BRAY REGD.

W. E. BRAY & CO. LTD



DUALOADER

FELTHAM

MIDDLESEX

Telephone : Feltham 3471-2-3-4.
Cables : Braydozer London.
Telegrams : "Braydozer, Feltham"

CRAWLER LOADER

C

THE HEART OF INDUSTRIAL EFFICIENCY

At the heart of modern power stations and up-to-date factories you will find

MITCHELL BOILERS

giving impressively reliable service.

High efficiency, low maintenance needs and keen prices ensure a steadily increasing demand for

MITCHELL INSTALLATIONS

in new industrial building programmes.

Although many Mitchell boilers are specially designed for specific loads, the standard range covers all normal steam-producing needs.

MITCHELL

WRITE TO MITCHELL ENGINEERING LIMITED, 1 BEDFORD SQUARE, LONDON, WC1

1402

INDEX TO 'JOURNAL' ADVERTISERS

A — PAGE

A.C.E. Machinery, Ltd. ... ...
Abbott, Birks & Co., Ltd. ... ...
Acme Wringers, Ltd. ... ...
Aerogen Co., Ltd. ... ...
Aerograph Co., Ltd. ... ...
Alder & Mackay, Ltd. ... ...
Aldridge & Ranken Ltd. 421
Allan Taylor (Engineers), Ltd. ... ...
Allen, John & Son (Oxford) Ltd. 408
Amal, Ltd. 471
Ascot Gas Water Heaters, Ltd. ... ...
Ascot Gas Water Heaters, Ltd. (F. A. Neat) ...
Ashmore, Benson, Pease & Co. ... ...
Ashworth & Parker, Ltd. 425
Aspinall's (Paints), Ltd. ... ...
Associated Lead Manufacturers, Ltd. ... ...
Associated Lead Manufacturers, Ltd. (Rustodian) 435
Atlas Preservative Co., Ltd. 407
Audley Engineering Co., Ltd. ... ...
Autocontrol Boilers, Ltd. ... ...
Automatic Telephone & Electric Co., Ltd. ...
Automotive Products, Ltd. ... ...
Averill, C. R., Ltd. 471

B

Bale & Church, Ltd. 472
Balfour, Henry, & Co., Ltd. ... ...
Bayley, Thos. (Great Bridge) Ltd. ... ...
Begwaco Meters, Ltd. ... ...
Benham & Sons, Ltd. ... ...
Birtley Co., Ltd. ... ...
Blakeley Firth, Sons & Co., Ltd. ... ...
Bolton's Superheater & Pipe Works Ltd. ...
Booth, John, & Sons (Bolton), Ltd. ... ...
Bratt Colbran, Ltd. ... ...
Bray, George, & Co., Ltd. ... ...
Bray, W. E., & Co., Ltd. 437
British Flint & Cerium Manufacturers, Ltd. ...
British Gas Purifying Materials Co. 473
British Jeffrey-Diamond, Ltd. ... ...
British Oxygen Co., Ltd. ... ...
British Paints, Ltd. ... ... Cover II
British Rototherm Co., Ltd. 436
British Thermostat Co., Ltd. 429
British Thomson Houston, Ltd. ... ...
British Tyre & Rubber Co., Ltd. 406
British Vacuum Cleaner & Engineering Co., Ltd.
Broadbent, Thomas, & Sons, Ltd. ... ...
Broom & Wade, Ltd. ... ...
Brown, J., & Co., Ltd. ... ...
Bugden, Thos., & Co. ... ...

C

Cambridge Instrument Co., Ltd. ... ...
Cannon (G. A.), Ltd. ... ...
Cascade Water Coolers, Ltd. ... ...
Cathodic Corrosion Control, Ltd. ... ...
Cementation Co., Ltd. 418
Cinema-Television, Ltd. ... ...
Clapham Bros., Ltd. ... ...
Clayton, Son & Co., Ltd. ... ...
Clifford Engineering Co., Ltd. ... ...
Cochrane (Middlesbro') Foundry, Ltd. ... ...
Cohen, George, Sons & Co., Ltd. ... ...
Concrete Proofing Co., Ltd. 426
Consolidated Pneumatic Tool Co., Ltd. ... ...
Consett Iron Co., Ltd. 410
Cort, Robt., & Son Ltd. ... ...
Crane, Ltd. ... ...
Crone & Taylor, Ltd. 471
Crosby & Co., Ltd. ... ...
Crossley Bros. ... ...
Crowley Russell, & Co., Ltd. 431
Curtis, A. L., & Co. ... ...
Cutler, Samuel, & Sons, Ltd. ... ...

D

Davenport Engineering Co., Ltd. ... ...
Davey, Paxman & Co., Ltd. ... ...
Deb Chemical Proprietaries Ltd. ... ...
De la Rue, Thomas, & Co., Ltd. (Gas Group) ...
Dempster, R. & J., Ltd. ... ... Cover I
Dempster, Robert, & Sons, Ltd. ... ...
Denison & Son, Ltd. ... ...
Derbyshire Silica Firebrick Co., Ltd. ... ...
Diaphragm & General Leather Co., Ltd. ...
Dick, R. & J., Ltd. ... ...
Donkin (The Bryan) Co., Ltd. ... ... Cover II
Douglas, Wm., & Sons, Ltd. 476
Drakes, Ltd. ... ...
Dresser Manufactures (England), Ltd. ... ...
Drew, H. B., Ltd. ... ...
Drummond Patents Ltd. ... ...
Dunlop Rubber Co., Ltd. (Gen. Rubber Goods Division) ... ...

E

E.B. Refractory Cement Co., Ltd. 471
Edgar, William, & Son, Ltd. ... ...
Elcontrol, Ltd. ... ...
Electroflo Meters Co., Ltd. ... ...
Electrolux, Ltd. ... ...
Elliott Bros. (London), Ltd. 433
Erskine, Heap & Co., Ltd. 413
Essard Ltd. ... ...
Essex Partners, Ltd. ... ...
Ether, Ltd. ... ...
Evered & Co., Ltd. ... ...
Ewart & Sons Ltd. ... ...
Ewart Chainbelt Co., Ltd. ... ...

F

Fielden Electronics, Ltd. ... ...
Fisher & Ludlow, Ltd. ... ...
Fisher Governor Co., Ltd. 433

PAGE

Flavel, S., & Co., Ltd. 412
Fowler, John, & Co. (Leeds), Ltd. ... ...
Frank: Compressed Pile Co., Ltd. ... ...
Franklin Furnace Co., Ltd. 414
Fry's Metal Foundries, Ltd. ... ...
Furmanite Engineering Co. (1929) Ltd. 476

G

Gas Purification & Chemical, Ltd. 472
General Descaling Co., Ltd. ... ...
General Electric Co., Ltd. ... ...
General Gas Appliances, Ltd. ... ...
Gibbons Bros., Ltd. ... ...
Glover, George, & Co., Ltd. 405
Glover, Thomas, & Co., Ltd. 442
Godfrey, Sir George, & Partners (Industrial), Ltd.
Goodall Clayton & Co., Ltd. ... ...
Goodyear Mechanical Goods ... ...
Grant, Lyon, & Co. Ltd. ... ...
Graphite Products, Ltd. ... ...
Green & Boulding, Ltd. ... ...
Gunite Construction Co., Ltd. ... ...

H

Hamilton, A. H., & Co., Ltd. ... ...
Hardman & Holden, Ltd. ... ...
Harris & Pearson, Ltd. ... ...
Harrisons (London), Ltd. ... ...
Hattersley & Davidson ... ...
Hayward, E. & Co. (Fabrications) Ltd. ... ...
Hick Hargreaves & Co., Ltd. ... ...
Hillmot, Ltd. ... ...
Hills (West Bromwich), Ltd. ... ...
Holman, Michell & Co., Ltd. ... ...
Holmes, W. C., & Co., Ltd. 475
Honeywell Brown, Ltd. ... ...
Hopkinsons, Ltd. ... ...
Horseley Bridge & Thomas Piggott, Ltd. ...
Horstmann Gear Co., Ltd. ... ...
Howden, James, & Co., Ltd. ... ...
Humphreys & Glasgow, Ltd. 440

I

Ideal Boilers & Radiators, Ltd. ... ...
I.C.I. Ltd. (Fyffes Fittings) 422
I.C.I., Ltd. (Metals Division 420
Inertol, Ltd. ... ...
Ingham, John, & Sons, Ltd. ... ...

J

Jeavons, E. E., & Co., Ltd. ... ...
Jeavons Engineering Co. 408
Jenkins, W. J., & Co., Ltd. ... ...
Johnson, C. H. (Machinery), Ltd. ... ...

K

Keay, E. C. & J., Ltd. ... ...
Keelavite Rotary Pumps & Motors Ltd. ...
Keith Blackman, Ltd. 476
Kent, Geo., Ltd. ... ...
Kings Patent Agency, Ltd. 473
King, Walter, Ltd. 472
Kirk & Co. (Tubes), Ltd. 412
Kirkham Hulett & Chandler, Ltd. ... ...

L

LaFarge Aluminous Cement Co., Ltd. 417
Laidlaw, R., & Son (Edin.), Ltd. ... ...
Lamont, James H., & Co., Ltd. ... ...
Lancashire Dynamo & Crypto, Ltd. ... ...
Le Bas Tube Co., Ltd. ... ...
Leeds Fireclay, Co., Ltd. ... ...
Lindsay, Henry, Ltd. 428
Lionweld, Ltd. ... ...
Lind, Peter, Ltd. ... ...

M

Macpherson, Donald, & Co. Ltd. ... ...
Magnetic Valve Co., Ltd ....
Main, R. & A., Ltd. 466, 467
Mapel Metal & Pipeline Endurance, Ltd. ... 434
Matterson, Ltd. ... ...
Meltham Silica Fire Brick Co., Ltd. ... ...
Meters, Ltd. ... ...
Metropolitan Leather Co., Ltd. ... ...
Metropolitan Vickers Electrical Co., Ltd. ...
Midland Iron & Hardware Co. (Cradley Heath), Ltd.
Milnes Meters, Ltd. ... ...
Mint, Birmingham, Ltd. ... ...
Mitchell Engineering, Ltd. 438
Mitchell, H., & Co. ... ...
Monitor Engineering & Oil Appliances, Ltd. ... 434
Monk, A., & Co., Ltd. ... ...

N

National Benzole Co., Ltd. ... ...
National Cash Register Co., Ltd. 426
National Enamels, Ltd. ... ...
Newton Chambers & Co., Ltd. ... ...
Norwest Construction Co., Ltd. ... ...
Nu-Swift, Ltd. 472

O

Oxley Engineering Co., Ltd. 419

P

Parkinson & Cowan (Gas Meters), Ltd. 442
Parkinson Stove Co., Ltd. ... ...
Pase, E., & Co., Ltd. 430
Peebles & Co., Ltd. ... ...
Perl Controls, Ltd. 441
Plenty, & Son Ltd. ... ...
Power-Gas Corporation, Ltd. ... ...
Press, William, & Son, Ltd. ... ...facing p. 453
Pulsometer Engineering Co., Ltd. ... Cover IV

R

PAGE

Radiant Heating, Ltd ... ...
Radiation, Ltd. 460, 461
Rawlplug Co., Ltd. 418
Reavell & Co., Ltd. 471
Ride & Bell, Ltd. ... ...
Riley, A. J., & Son, Ltd. ... ...
Roberts, R. E., & Sons, Ltd. ... ...
Robinson, J. H., & Co. (Liverpool), Ltd. ...
Rook Bros., Ltd. ... ...
Royston, Geo., & Sons, Ltd. ... ...
Rozalex Ltd. ... ...
Russell, R., & Sons Ltd. 428

S

Salter, T. E., Ltd. ... ...
Sankey-Sheldon Ltd. ... ...
Senior Economisers, Ltd. ... ...
Shaw & McInnes Ltd. ... ...
Siebe Gorman & Co., Ltd. ... ...
Siemens-Schuckert (Great Britain), Ltd. ...
Sigma Instrument Co., Ltd. ... ...
Simon-Carves, Ltd. ... ...
Simon, Richard, & Sons, Ltd. ... ...
Sisson, W., & Co., Ltd. 436
Smith Meters, Ltd. ... ...
Smith, Thos., & Sons (Rodley), Ltd. ... ...
Spencer Bonecourt, Ltd. ... ...
Sperryn & Co., Ltd. 405
Stanton Ironworks Co., Ltd. ... ...
Staveley Iron & Chemical Co., Ltd. 409
Steels Eng. Products, Ltd. ... ...
Stein, John G., & Co., Ltd. ... ...
Stelcon (Industrial Floors) Ltd. ... ...
Stewart & Gray, Ltd. ... ...
Stewarts & Lloyds, Ltd. ... ...
Stoves, Ltd. ... ...
Strachan & Henshaw, Ltd. ... ...
Stringer Bros. 474
Sugg, Wm., & Co., Ltd. 427
Summerson, Thos., & Sons, Ltd. ... ...
Supra Chemicals & Paints, Ltd. ... ...
Sutcliffe, R., Ltd. ... ...
Sutcliffe Speakman & Co., Ltd. 424
Sutherland, A. G., Ltd. ... ...

T

T & T Works, Ltd. ... ...
Tangyes, Ltd. 430
Taylor Bros. ... ...
Thermal Syndicate, Ltd. ... ...
Thompson, Edward, Ltd. 436
Thompson, John, Conveyor Co. ... ...
Thorp, Thomas, & Co., Ltd. ... ...
Tully Engineering Co., Ltd. ... ...
Turners Asbestos Cement Co., Ltd. ... ...

U

Underpressure Engineering Co., Ltd. ... ...
United Kingdom Construction & Engineering Co., Ltd. 415
Unit Superheater & Pipe Co., Ltd. ... ...

V

Vaughan, Edgar & Co., Ltd. ... ...
Visco Engineering Co., Ltd. ... ...
Vulcan Stove Co., Ltd. ... ...

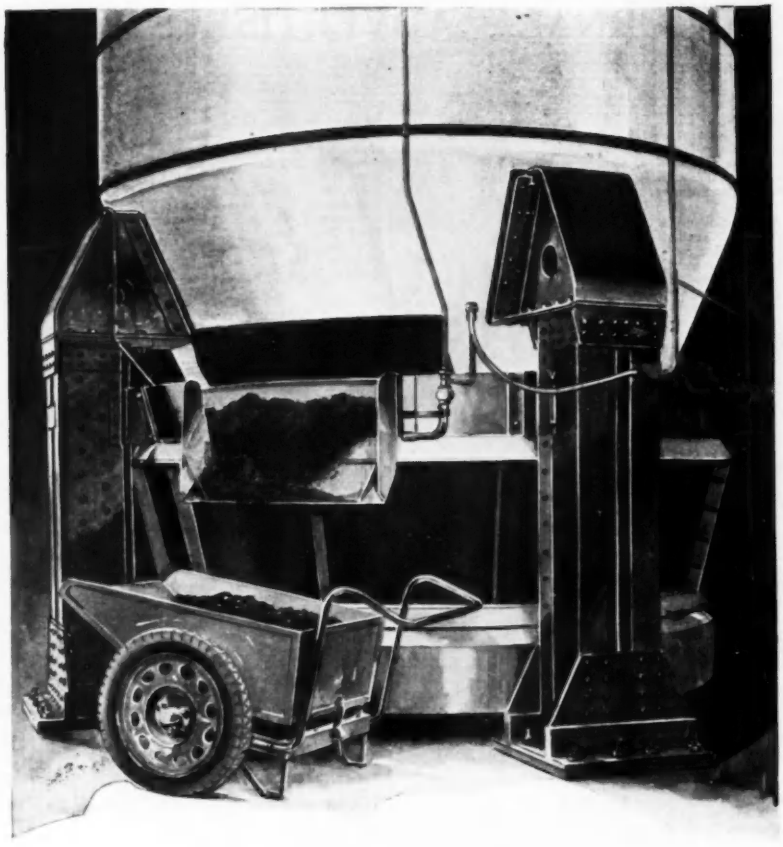
W

Wade Couplings, Ltd. ... ...
Wakelin, F. H., Ltd. 473
Walker, C. & W., Ltd. ... ...
Walker, Crosweller & Co., Ltd. ... ...
Walker, Wm., & Sons (Hanley), Ltd. 414
Waller, George, & Sons, Ltd. 432
Walter King, Ltd. 472
Ward, Thos. W., Ltd. 416
Watson, Robt., & Co. (Constructional Engineers) Ltd
Weir, G. & J., Ltd. ... ...
Wellington Tube Works, Ltd. ... ...
Wellman Smith Owen Engineering Corpn., Ltd.
West's Gas Improvement Co., Ltd. ... Cover III
West's Gas Improvement Co., Ltd. (C.O.L.) Division) ... ...
West's Piling & Construction Co. ... ...
Westwood & Wrights, Ltd. ... .
Whessoe, Ltd. 423
Whitley Moran & Co., Ltd. 421
Wilkes, A. H., & Co., Ltd. 428
Willey & Co., Ltd. ... ...
Williams, John E., Ltd. ... ...
Williamson Cliff, Ltd. ... ...
Wilson, George, Gas Meters, Ltd. 411
Winn & Coales, Ltd. ... ...
Woodall-Duckham Construction Co., Ltd. facing p. 452
Wood, Hugh, & Co., Ltd. ... ...
Wormald Patent Locks Co., Ltd. ... ...

Y

Yorkshire Copper Works, Ltd. 425

Appointments Vacant 473, 474
Appointment Wanted 473
Auction 473
Contracts Open ... ...
Educational ... ...
Fellowship ... ...
Miscellaneous 474
Patents 473
Plant For Sale 474
Publications 473



Today and Yesterday

Automatic Clinkering + + + +

Humphreys and Glasgow Labourless Carburetted Water Gas Plants with hydraulic, mechanical or pneumatic, automatic operation and unit capacities ranging between **1,000,000 and 10,000,000 cubic feet per day.**

Installations by

HUMPHREYS & GLASGOW LTD

HUMGLAS HOUSE · CARLISLE PLACE · LONDON S·W·1

Telephone VICtoria 3961

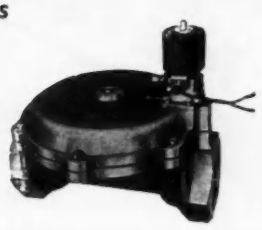
ESTABLISHED 1892

Everything under control

THE PERL RANGE OF AUTOMATIC TEMPERATURE & SAFETY CONTROLS includes

MAGNETIC GAS VALVES

Straight through type ¼", ⅜" and ½" B.S.P. 2-way, diaphragm type ¾" to 6" B.S.P. For standard and non-standard voltages. A.C. or D.C. Silent operation. Consistently reliable.

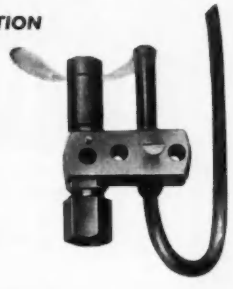


THERMOSTATS & RELAY VALVES

Direct and indirect acting. 0-1 100° C. Relay Valve sizes of ¼" to 6" B.S.P. Low or high pressure types. For high/low or complete cut-off. Consistently reliable.

IGNITION & COMBUSTION PROTECTION

A comprehensive range to suit almost any application or size of supply. Advanced designs give fullest protection, even under difficult conditions. Consistently reliable.



If your problem is flame-failure or thermostatic control—PERL can solve it!

PERL CONTROLS LTD
672 · FULHAM ROAD · LONDON S.W.6
PHONE: RENOWN 5555 (3 LINES)

2

Gas Journal

VOL. 282 NO. 4798 MAY 18, 1955

107TH YEAR

MANAGING DIRECTOR: Clifford A. King

EDITOR: Trevor G. Williams, A.M.I.Mech.E., Assoc.Inst.Gas E., M.Inst.F.

DEPUTY EDITOR: Arthur C. Cross

Published by Walter King Limited, 11, Bolt Court, Fleet St., London, E.C.4

Telephone: Central 2236-7. Telegrams: Gasking, Fleet.

CONTENTS

EDITORIAL COMMENT

First Things First 443
Carrier Gas in London 444
A Popular View on Coke 445

TECHNICAL RECORD

Changes I Should Like to See. By W. S. Hubbard 450
Large Scale Carrier Gas Carbonization in the North Thames Area. By A. F. Grant and C. H. Lewis 453
The Testing Time is Near. By Albert Allen 458

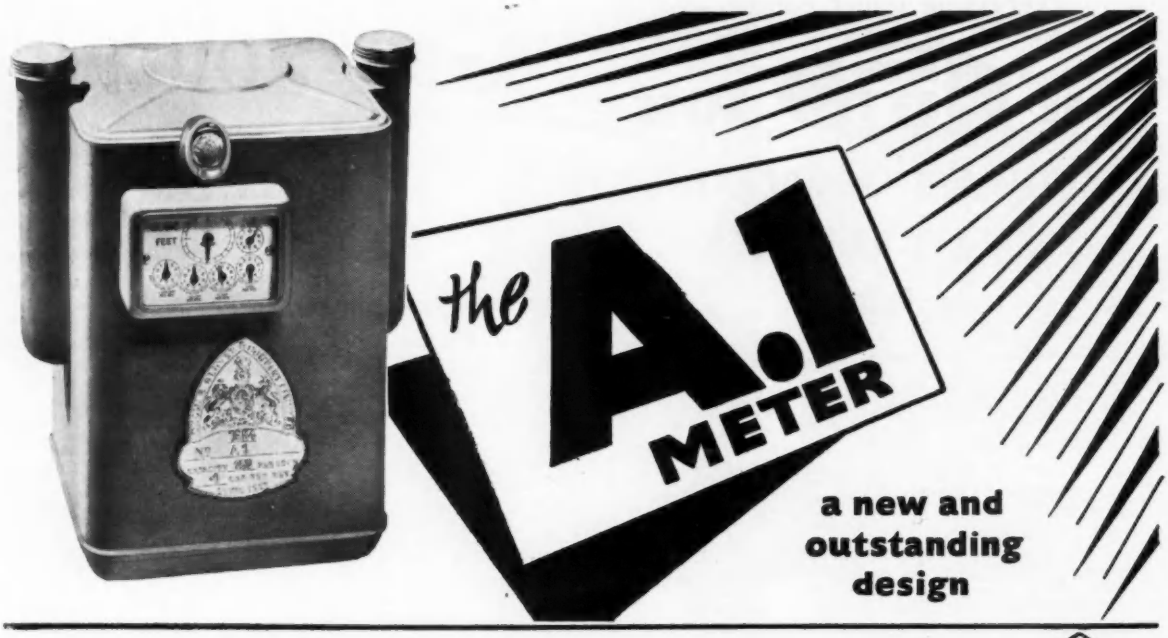
SPECIAL ARTICLE

North Thames, Fulham to Slough Pipeline 447

NEWS OF CURRENT EVENTS

Diary 446
Personal 446
Obituary 446
Public Lighting Engineers 446
Eastern Juniors Annual General Meeting 462
Watson House Centre and Its Work 462
Cookers in the Making 462
British Gas Staff Association 463
B.I.F. Industrial Gas Conference Luncheon 465
North Wales Gas Grid 465
Telemetering Equipment Demonstrations 468
N.C.B. Scholarships 468
North Eastern Consumer Service 468
Replanned 'Teddington' Works Restaurants 469
New Huddersfield Gas Offices 469
Sixth Year Results Forecast 469
Manchester and District Section, I.G.E. 470
Company Meeting: Parkinson & Cowan Ltd. 470

PUBLISHERS' NOTICE, SEE PAGE 472



THOMAS GLOVER & CO. LTD.

GOTHIC WORKS, ANGEL ROAD, EDMONTON, LONDON, and BRANCHES

TC13

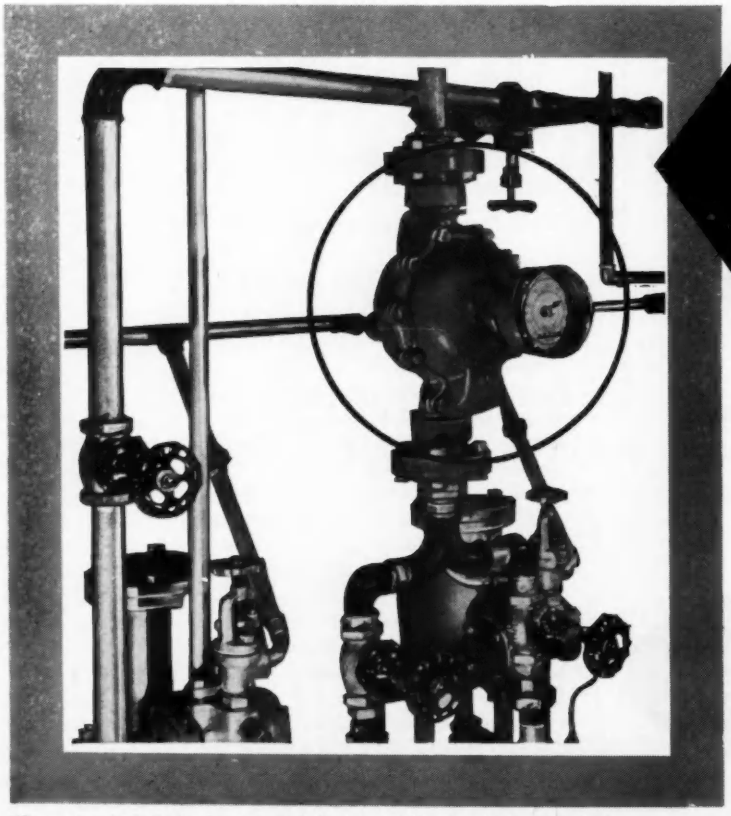


Illustration of a boiler feed meter installed at United Phosphate Ltd., valves by Crane

METER for EFFICIENCY

how we help industry to know its costs

We are manufacturers of

LIQUID PROCESS METERS
BOILER FEED METERS
TELEMETERING EQUIPMENT
LEVEL INDICATING EQUIPMENT
CONTROL APPARATUS

MEASUREMENT LTD

P.O. BOX 18
119, UNION STREET, OLDHAM, LANCS.
Phone MAin 6432

A COMPANY OF THE PARKINSON AND COWAN GROUP

Gas Journal

VOLUME 282. No. 4798. MAY 18, 1955. 107th YEAR

First Things First

TO some, nationalisation, as a part of political philosophy, is the panacea for all industrial evils—others see it as a brake on progress and individual initiative. Most are agreed, however, that the basic fuel industries should belong to the nation and that they should be operated in a manner consistent with the best interests of the community as a whole. In the six years since the gas industry passed into public control, it has faced and surmounted more fundamental problems concerning its most vital aspects than in any equivalent period in its history. The industry is, in fact, so hard pressed with its day-to-day problems that it often finds it difficult to spare the time to reflect upon the long-term effects of the trends which are taking place around it.

It is for this reason, if no other, that the recent address of Mr. A. Allen, Chairman of the Midland Section of the Institution of Gas Engineers, in Birmingham, sounds as a clarion call to the whole gas industry, prompting it to take stock of itself and to consider where it is going, and how. As Divisional General Manager of the Warwickshire Division of the West Midlands Gas Board, Mr. Allen speaks as a senior officer of one of the most progressive of the area boards, and as a practical man who sees the need for the gas industry to have a clearly defined policy, one which those inside the industry and the general public can easily understand. His address is reproduced in an edited version on p. 458 of this issue of the 'JOURNAL,' and should be carefully studied by all those connected with the industry.

One of the most important of the many good points raised in his address was, in our view, that concerning the clear definition of the gas industry's plans for the future. A policy of 'drift' can never secure the interest of the public nor of the employees of the industry itself. Our competitors in the fuel field do not hesitate to declare to the country their plans for future development and expansion of output even though, in some cases, we have reasons to believe that they are rather over-optimistic. Can we say that the people of this country know what its gas industry proposes to do in the next ten years—can we be sure that even the staff operating the industry have a clear picture of what is happening? As Mr. Allen says, 'the industry is confronted and somewhat bewildered with the number of uncertainties, complexities and differences of opinion regarding gas production and supply in the future.' It is clearly imperative that any confusion which exists in the minds of consumers or employees about the gas industry's intentions should be dispelled as soon as possible and that the chief spokesmen of the industry should speak with a united voice on matters of fundamental policy. If this is not the case, the nation cannot help but feel that an overall policy is lacking and that each problem is approached and solved on its own merits and in its particular context only.

The question of recruitment for, and salaries in, the industry are two other important matters raised by Mr. Allen in his address. He said, 'To ensure the continual success of the (gas) industry, something will have to be done to improve the recruitment of potential leaders, senior technicians, engineers and managers.' We cannot help feeling that, since the war, the industry has been able to 'live on its own fat' so to speak, as as far as senior men are concerned. The closing of small works and the trend towards the integration of a small number of large stations in many area boards has provided the industry with a pool of trained men from which to draw its requirements for staffing new or vacated appointments. Insofar as this has occurred, the industry has been cushioned from the competition of private enterprise for the relatively scarce supply of skilled technical ability outside the industry. There will come a time, however, and may be not so far off as some would like to think, when the gas industry will have to compete openly with all comers for the skill it requires. This, of course, ties up with Mr. Allen's further point about the salaries paid to top executives in the industry. To quote him, 'In looking for the reasons why our industry is failing disastrously to attract the right type of new entrants who should ultimately become chief technical and managerial executives, we cannot ignore the salaries of members of the Gas Council and full-time members of area gas boards, which are, of course, made public. Most men quite naturally try to get some idea of top salaries in order to enable them to assess the possibilities of lower grades.' He shows how the top executives of the gas industry earn much less than their counterparts in private industry and how in one enterprise where there were eight executive directors, each received an emolument three times as much as an area board chairman. On this basis, one can deduce that salaries throughout the

gas industry are low compared with those paid in private companies for the same sort of work and responsibility and this, of course, is borne out in practice in many cases. The moral is clear. In an era of full employment, if the gas industry wants the best men, it will have to pay the best salaries.

Following from this proposition, we turn to Mr. Allen's suggestion that there should be more incentive schemes in the gas industry to attract the right kind of labour, and having recruited it, to keep it. He mentions the profit-sharing schemes in current use in private industries to identify the interests of the worker with his employers; unfortunately in a nationalised industry, such schemes cannot be worked. Many of the old private gas companies had excellent arrangements for the workers' co-partnership in the business, and there can be no doubt that these schemes cemented the loyalty and promoted the best efforts of the employees. What has to be recognized, now, is that the incentives to maximum effort which existed in pre-nationalisation days, have largely been removed, and that they have not been replaced. It is true that many conditions of working are much improved in the gas industry, particularly on the works' side—but then there has been a general improvement throughout industry so this hardly counts. Wages and salaries are higher than they were, but they are still not so high as those in some other industries where the work is no more arduous or skilful. Incentive schemes are not easy to devise for such as the gas industry but, nevertheless, it may be well worth the effort to experiment more boldly with them where they are feasible—say on the selling side of the industry.

There is so much deserving of thought and comment in Mr. Allen's address that it is difficult to compress all that one would like to say into a small compass. However, a final reference must be made to his remarks on research and development. Since the coming years are likely to see the gas industry more as the 'smokeless fuel' industry supplying both gas and reactive coke, the research and development programmes of the industry should be based on this fundamental fact. Mr. Allen says, 'Our industry requires an intensification of industrial research and investigation work rather than what may be termed fundamental scientific research,' and one cannot help but agree that, in these days, there is immense scope and a pressing need for the practical as against the academic approach to research in the industry. We have commented before in these columns on the great opportunities for our industry which can be discerned in the midst of the turmoil and upheaval of the present time. If only 'we can separate the wheat from the chaff without delay' as Mr. Allen says, if only we can distinguish what *really* matters from the side issues, the trends that *really* mark the way from the passing phase—we shall see the gas industry reach its true fulfilment.

Carrier Gas in London

IF it is quite certain that gas must be distributed in the area of the North Thames Gas Board at a calorific value at least 500 B.Th.U. per cu.ft., and we take it that this is not in dispute, then to secure adoption in this the most important area in the country, the carrier-gas technique must justify itself when making gas at this value or something over. And in view of the facts of coal supply, it must justify itself in the treatment of Durham coals with relatively high swelling properties. The results which the representatives of the Board had seen at Manchester in 1953 included no doubt those reported by Mr. M. Sinclair Gaskill in the paper he presented to the London Juniors in 1954. With Durham slack and with producer gas as the carrier throughput was increased from 3.9 tons with steaming to 450 to 6.37 tons when diluting to about the same value. This was sufficiently interesting to induce the Board to make a preliminary trial in two W.D. retorts at Kensal Green and later the full-scale tests in a fully equipped bench of similar retorts at Bow Common, the results of which have now been published in the excellent paper by A. F. Grant and C. H. Lewis, reported at length in this and a previous issue of the 'JOURNAL'.

As the object of the tests was to explore the possibilities of the technique at 500 B.Th.U. it is not surprising that producer gas as a carrier was not tried. The use of blue water gas and coal gas was fully tested, as well as a mixed gas to simulate 'complete gasification gas', and a test was made with coal gas at reduced combustion chamber temperatures. The last-named is particularly interesting because if it had proved to be both technically and economically successful it might have led to a longer life of refractories. The technical results here reported, the costs calculated from them, and the conclusions drawn from them will not surprise anyone familiar with the literature on the subject. The difference is that we now have the immense authority of the North Thames engineers behind them, at any rate as related to this particular set of conditions. The technical details of the trials will be read with close attention. They do not appear to reveal any difficulties which cannot be surmounted. 'The process can be established and maintained reliably at a considerable increase in coal throughput by normal works personnel'. Calculated costs indicate that the cheapest therm is still made by steaming but 'with gas at a declared calorific value of 500 B.Th.U. the thermal output at Bow Common can only be increased by injecting coal gas'. Therms per ton of coal, however, were reduced and estimated cost per therm was increased. There appears no reason to be deduced from these results to doubt that blue water gas is the best all-round carrier gas—it is the 'carrier gas' of steaming—but it can only be used when the declared value is around 450. The conditions of coal supply and calorific value makes this process unsuitable for the North Thames Gas Board, a dictum which also applies to blue water gas since with this carrier the thermal output of the works is decreased and the cost increased, when making gas at 500 B.Th.U. But one feels that the discussion of this paper will excite even more interest than the paper itself. For here we have the views of Dr. J. Burns, Dr. S. Pexton, as well as those of Mr. Gaskill and to some extent a repetition of those of Dr. G. E. Foxwell on this most intriguing subject.

Dr. Burns examined the carrier gas technique from the points of view, first, of its use in, or association with, the production of gas at 500 B.Th.U. and secondly, of its effect on coke production. And he put forward three interesting posibilities which we shall not

repeat here. The most interesting of them was the suggestion to make a 450 B.Th.U. gas with the carrier gas technique 'plus enrichment by Hall gas at 1,000 B.Th.U. to give a mixed gas of 500'. Coke and breeze for sale would be very good but it did not provide a cheaper system than the normal methods of producing 500 B.Th.U. gas either by coal gas and water gas or by coal gas with benzole extraction. This conclusion applies to the conditions in this particular area and Dr. Burns agreed that it might be worth while considering the new method for different economic conditions up and down the country. Dr. Pexton's contribution to the discusion was a delightful little essay in continuation of his 'Fuel Requirements of Carbonizing Plant' of 1953. It is interesting to note that the trend in the design of vertical retort settings has been in the directions indicated by Dr. Pexton. Every effort is now made made to recover heat from the base ironwork and coke boxes. But the heating of primary air to producers from this source has not yet been practised.

Dr. Foxwell still thinks that the mechanism of the carrier gas as compared with the steaming process remains unexplained and we wonder whether he is satisfied with Mr. Lewis' note of the heat requirements of the two processes. No doubt the extent and nature of the plastic layer has something to do with it and the behaviour of the inert gas may be different from that of a mixture of nascent water gas and superheated steam, but one feels that the heat requirement is the crux of the matter; the explanation might be, as Mr. Grant put it, 'related to the endothermicity of the water-gas reaction.' Mr. Gaskill re-affirmed his view that water-gas was the best form of carrier gas. They had explored the possibility of blending coals, with the object of utilizing low rank coals, but this involved breaking down to a very small size and the carrier gas technique did not overcome the reduction in throughput, as experienced, for instance, in the treatment of slacks, to any great extent, and that 'only with considerable operational difficulty'. And he did not think briquetting would be a paying proposition.

The conclusion seems to stand out that this technique is not for the higher calorific values. There still seems a possibility that it might be useful in increasing output from a given plant making gas at around 450 B.Th.U. from coals of somewhat lower rank than those of the Durham coalfield. It seems to us that the possibilities of working at lower combustion chamber temperatures with these lower rank coals might well be further explored. And the usefulness of the technique in the direction of giving the increased output of solid smokeless fuel called for in the Beaver Report is still open to question.

A POPULAR VIEW ON COKE

THE value of popular press articles lies in the fact that they not merely impress the public but that they also reflect the public's opinion. And, in domestic matters, public opinion nearly always, despite its tendency to be inarticulate, succeeds in setting the pace and in formulating the decisions of industry regarding its type of products. An excellent example of an article which thus summarizes public opinion is one by Hilde Marchant in a recent issue of *Picture Post*. The writer remarks that, although the demand for, and the price of, coke, are going up, nevertheless, during the cold spell of last winter, many parts of the country had to wait as much as six weeks for it. The article is fair enough in its comments and conclusions when one recognizes the high cost of coal to the gas industry and the necessity for it to have high quality coal. But there are 'serious forebodings'—to the author's mind—in the fact that the Beaver Committee thought fit to work out its data on the heat comparison between coke and coal on a cost basis by adding an extra £1 to the current price of coke. 'Coke still comes out best' Miss Marchant concludes. 'Therm by therm, penny by penny, even though the extra £1 has been added. But it seems to be a sign of things to come when they (the committee) talk about higher quality, standardization, higher demand and more costly processing. It is, I fear, another threatened decimal on the cost of living'. Assuming that most people at the moment prefer to use coal in their grates, her fears do not appear to tie up with a previous statement in the article—'that about £2 10s. a ton' in saved by using coke instead of coal—if the coke is properly used'.

The trouble about 'the shortage of coke during the winter' was, it seemed to the author, caused by the lack of distribution facilities, for Gas Industry House had assured her 'we were never short of coke'. We appreciate that it is not the gas industry's fault that means of distributing coke are *not* adequate in the coldest weather, and that the industry has made it clear to householders that they should stock-pile during the summer. But we also appreciate that something has to be done about this problem before next winter if we are not to have continual recurrence of the same complaints. We wonder whether there would be any comparable distribution difficulties with the private sources which produce synthetic cokes and smokeless fuels if these fuels could be purchased by the public at an attractive figure (which has not so far occurred). Of course, household stock-piling in the summer where there is room for it is part, if not most of the answer. This would ease the burden on the gas industry and allow those without the necessary storage space to be given priority in winter. But it is not the whole of the answer which must take into account the predilections of the consumers and the fact that many have no adequate storage facilities. To sum up then, we re-iterate: good coke must be sold as widely as possible and at a reasonable price; as much attention must be given to its production, preparation and distribution as is at present given to gas. The article in *Picture Post* provides an illuminating plimpse of the way the public is thinking about coke and could perhaps, give the gas industry a fresh slant on an old problem.

INCREASED COST OF GAS IN THE WEST MIDLANDS

The West Midlands Gas Board on Monday announced increases in the price of gas and issued a warning that an imminent rise in the price of coal would mean still further increases. Consumers in most of the large towns, including Birmingham and Wolverhampton, will pay 1½d. more for the first 45 therms per quarter and 1½d. for consumptions in excess of that figure. While most average consumers in the area will pay 3½d. per week more for gas, the increase to Stoke-on-Trent consumers will average 4d. per week.

The British Petroleum Co., Ltd., announce that the D'Arcy Exploration Co. is drilling its first test oil well in Flintshire. The well, which will provide geological information, is being drilled near Mold, and has already reached over 900 ft.

Diary

May 19.—MANCHESTER JUNIORS: Visit to A. V. Roe & Co., Ltd., Woodford Works. 'Complete Gasification', Hartill, Spencer, and Wheatman.

May 20.—WALES G.C.C.: County Hall, Llandrindod Wells, 2 p.m.

May 21.—SCOTTISH JUNIORS (EASTERN): Golf Outing. Lundin Links.

May 23.—NORTH EASTERN G.C.C.: Leeds.

May 24-27.—INSTITUTION OF GAS ENGINEERS: 92nd Annual General Meeting, Portsmouth. For full programme see 'JOURNAL," April 27, p. 235.

May 27.—LONDON JUNIORS: Business meeting. Allan Taylor film. 178, Edgware Road, London, W.2. 6.30 p.m.

June 2.—SOUTH WESTERN G.C.C.: 34, Bridge Street, Taunton, 11 a.m.

June 4.—SCOTTISH JUNIORS (EASTERN): Annual Outing. Edinburgh. Visit to Granton works in morning.

June 7.—SOUTH EASTERN G.C.C.: Caxton Hall, Westminster, 2.15 p.m.

June 8.—MANCHESTER JUNIORS: Visit to Newton Chambers, Thorncliffe.

June 11.—SCOTTISH JUNIORS (WESTERN DISTRICT): President's Day visit to Trudeston Gasworks, Glasgow.

June 13-14.—EASTERN SECTION I.G.E.: Annual General Meeting, 'Some Problems Involved in the Manufacture and Distribution of Gas,' B. Wilkinson. Sheringham.

June 14.—NORTHERN G.C.C.: 30, Grainger Street, Newcastle-upon-Tyne. 11.15 a.m.

Public Lighting Engineers

The annual conference of the Association of Public Lighting Engineers will be held at Folkestone on September 13-16 under the Presidency of Mr. J. M. Waldram, Senior Illuminating Engineer at the Research Laboratories of the General Electric Co., Ltd., who, following his induction at the Leas Cliff Hall on the Tuesday morning, will deliver his Presidential Address.

During the conference papers will be given on 'Local Authorities and Public Lighting', by Mr. Granville Berry and Mr. W. H. Shaw, City Engineer and Surveyor, and Lighting Engineer respectively of the City of Coventry; 'The Code of Practice for the Lighting of Roads Other Than Traffic Routes', by Dr. J. W. T. Walsh; 'The Lighting of Tree-lined Roads', by Mr. H. M. Ferguson and Mr. W. R. Stevens, of the G.E.C. Research Laboratories; and 'The Centralized Control of Street Lighting', by Mr. J. F. McKenzie (Automatic Telephone and Electric Co., Ltd.).

Delegates will have the opportunity of inspecting a comprehensive exhibition of street lighting apparatus and equipment together with an outside display of lamp columns and tower wagons. The exhibition and outdoor display will take place on a site in Langhorne Gardens opposite the conference hall.

Personal

MR. D. M. HESFORD, Chief Finance Officer of the Northern (N. & C.) Division of the National Coal Board, has been appointed Finance Director of that Division in succession to MR. H. W. MCQ. HEMBRY, who in March was appointed Deputy Chairman. He became Finance Officer of the Northern Division of the National Coal Board on vesting day, and when the Division was split into two in January, 1950, became Chief Finance Officer of the newly-formed Northern (N. & C.) Division.

SIR CHARLES BARTLETT has tendered his resignation as President of the Royal Society for the Prevention of Accidents. The Society has accepted the resignation with regret, particularly as Sir Charles intimated that his action was due to continued indisposition and was taken on the advice of his doctors. He was elected President in October, 1953, in succession to LORD LLEWELLIN, who relinquished the office when he was appointed Governor-General of the Central African Federation. Sir Charles was the Society's seventh President, and also among his predecessors were Lord Brentford and Lord McGowan.

MR. R. B. JARRITT has been appointed by the Le Bas Tube Company, Ltd., as its representative on the Eastern Counties area for the sale of GF malleable iron tube fittings and other specialities. He served his apprenticeship in the trade with Scott & Sargeant, of Horsham, from which he served overseas with the Royal Engineers. Mr. Jarritt is a keen sportsman, having rowed for the Worthing Rowing Club, whom he has represented in the Senior Sculls at many coastal regattas.

MR. G. A. VERNON has been appointed Sales Manager of the Gas Department of William Sugg & Co., Ltd., engineers and gas appliance manufacturers, of Vincent Works, Regency Street, Westminster. Mr. Vernon has been associated with the gas industry for 23 years. He was Northern Area Branch Manager of Ascot Gas Water Heaters, Ltd., for 13 years, and for the past 10 years was Sales Manager and a Director of Cannon (G. A.), Ltd. He is an Associate of the Institution of Gas Engineers and a Member of the Incorporated Sales Managers' Association.

Obituary

MR. ALFRED QUICK, Manager of Bampton gasworks from 1930 until his recent retirement, has died at the age of 75.

COLONEL L. G. PILKINGTON, M.C., a Director of Scientific & Projections, Ltd., and a well-known figure in the Engineering & Allied Employers Federation, died at his home at Frilsham-by-Hermitage, Newbury, Berks, on May 1.

MR. GUNTHER SCHWANK, who had spent most of his life dealing with various problems of space heating by gas, died on May 5. On February 28 he celebrated his 50th birthday, an important stage in a life dedicated to study and research. Mr. Schwank was born in Hamburg in 1905. Originally an apprentice mechanic, he studied in his spare time and qualified as an engineer. He also qualified as a political economist as well as passing his law examinations. At the age of 25, he was already busying himself with problems relating to industrial heating by gas. In 1937-38 he succeeded in making what he claimed to be the first infra-red radiant for high temperature functioning at low pressure, for which a patent was obtained in 1939. In 1950 he made great strides in his invention; he took out new patents, and went on to put them to practical purposes. This he did in collaboration with Hailer-Meurer-Prometheus G.m.b.H. of Hamburg. The Schwank factory in Cologne is a model factory with an ultra-modern laboratory where specialists have at their disposal apparatus with unique measurement capabilities. The Schwank infra-red radiants are sold in almost all countries of Europe and the United States.

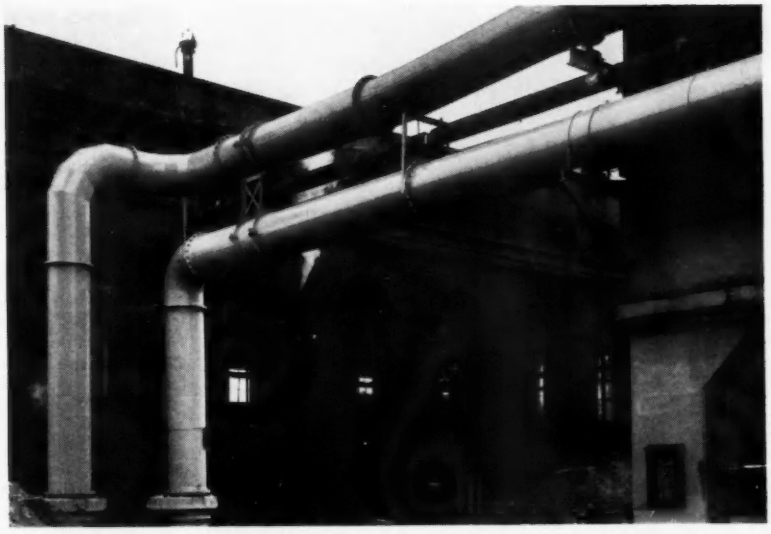
MR. EDWARD J. TUCKER, Vice-President and General Manager of the Consumers Gas Company of Toronto, died on May 9. He was well known to a number of the more senior members of the gas industry both in Great Britain and in other European countries and was held in high regard by all who knew him. His death in his early sixties is attributed to his unremitting work for his Company and the industry; he was overtaken by a stroke three years ago while engaged in protracted and difficult negotiations with Washington for the necessary facilities to export Texan gas into Toronto, and had never entirely recovered his health. Mr. Tucker was a leading personality in Toronto and represented Canada on the Council of the American Gas Association and in the affairs of the International Gas Union. He also identified himself with many aspects of community work in Toronto, as also did his wife. He was always ready to put himself at the disposal of colleagues from abroad and, as he used to say, 'to interpret the Englishman and the American to one another'. Born in England, he was taken by his parents to Canada when he was 16, and his only subsequent visit to England was six years ago, when the International Gas Union met in London under the Presidency of the late Colonel C. M. Croft.

Part of the Fulham-Slough pipeline being lowered into the trench under the Western Region main railway line near Slough

Fulham-Slough Pipeline Inaugurated

THE opening at Fulham gasworks on May 9 by Sir John Maud, Permanent Secretary of the Ministry of Fuel and Power, of the 25-mile gas pipeline from Fulham works to Slough marked the completion of a great feat of engineering. First conceived five years ago, the Fulham to Slough pipeline carries the gas that is essential to the rapidly growing new industries and new housing estates of East Berkshire and South Buckinghamshire. It is big enough to supply any foreseeable demand for gas. The new pipeline marks also the virtual completion of the North Thames Gas Board's grid system, which is the most elaborate in the country. It stretches from Southend-on-Sea to High Wycombe. Through this grid to every part of the Board's area is pumped gas from the great modern riverside gasworks.

Most of the new pipeline is made up of cast iron pipes of a total weight of 18,000 tons. These have been laid underground at an average depth of 3 ft. (to the top of the pipes). There are no fewer than 11,150 joints, all of the flexible gland type, and 223,000 bolts. At special crossings of rivers and railways steel was used, 500 tons in all, and with welded joints. Diesel excavators and trenching machines, bulldozers, cranes and compressors were among the mechanized equipment used, and the Distribution Drawing Office employed every kind of surveying instrument in drafting the plans for the new pipeline. The entire pipeline holds at any one moment 15 tons of gas, an interesting and rather staggering fact.



The starting point of the Fulham-Slough pipeline at Fulham works

The pipeline above ground at the Richmond holder station

Of all obstacles encountered the greatest was the River Thames, which had to be crossed somewhere between Fulham and Barnes. Alternatives considered included a special tunnel, a special bridge or an existing bridge. After consideration the Board applied to the British Transport Commission for

permission to attach the pipeline to a new cantilever structure on the west side of Putney railway bridge, similar to the cantilevered footpath already existing on the other side.

The pipeline over the bridge is entirely made of welded steel and has the largest corrugated steel expansion joints ever made. At either end of the bridge are motorized valves, so that if an accident should occur on the bridge, the touch of a button shuts off the gas. An unusual feature of this part of the pipeline is that it is electrically insulated from the bridge structure, and from earth at each end. Because Putney High Street is so busy, the conventional 'cut and cover' or trench method could not be used, and instead a tunnel was driven. The pipe had to be laid at a depth of 9 ft. on account of the many other public utility services running beneath the roadway, and its welded steel has been made into special shapes to avoid these obstacles. The pipeline crosses the main road from Barnes Railway Station to Hammersmith at Barnes Station by making use of the pedestrian subway beneath the road. The pipes, which are buried under the footpath, occupy the full width of the subway and special methods were needed to lay them properly in such cramped working space.

Farther west, on Barnes Common, there was the problem of passing from north to south of the railway lines. Here the Board's engineers met with a stroke of luck, for they were able to use a disused cattle-creep. A cattle-creep is a subway beneath a railway line so that cattle may freely pass to and fro without using a road or level crossing. The final obstacle of this section of the pipeline was the tidal Beverley Brook, which was negotiated by tunnelling beneath its bed.

Trenching machine at work digging and loading spoil to a disposal truck

Next to the boundary wall of Richmond gasholder station is one of the few sections of the pipeline which is visible above ground. Here can be seen the special provisions for thermal expansion and contraction, for the cradles carrying the pipes are free to move slightly on their supports. Richmond pump house contains three electrically powered pumps, two being able to pump 500,000 cu.ft. of gas per hour, and the remaining one 250,000 cu.ft. per hour. A pressure increase of up to 5 lb. per sq. in. is possible.

The only available space for crossing the Thames at Twickenham Bridge was under the north side footpath of the bridge, but there was not enough height for a standard 36 in. pipe. Therefore, oval pipes made of steel, 30 in. high and 44 in. wide, were used. The pipeline next rises above ground at Longford River, Hanworth, which it crosses in a self-supported span.

Because of the tranquil beauty of the scenery, crossing the River Colne at Stanwell Upper Mill, it was decided to lay the pipeline so that it would be invisible. However, the bridge over the Colne is only 2 ft. deep and the pipe is 30 in. in diameter. The problem was solved by a specially designed pipe which would be an integral part of the bridge, replacing an existing part of the structure and able to bear the weight of traffic. This was done by permission of the County Engineer of Middlesex. The bridge is made of steel troughing, and therefore the special section of pipe takes the form of a

One of the supporting carriages to the pipeline over the Thames, showing arrangements for thermal expansion, adjustment of levels, and electrical insulation

rectangular box of welded steel plates and sections, welded into the bridge structure. From Stanwell Upper Mill the pipe was laid underground for several miles through flat and waterlogged land. Continuous pumping was necessary and on a large scale. Even so, the obstacle was great, for water pumped out tended to flow back into the excavations, and at times special pipes had to be laid to carry it to a safe distance. At one point progress was so delayed that 10 yards of pipeline took a fortnight to lay.

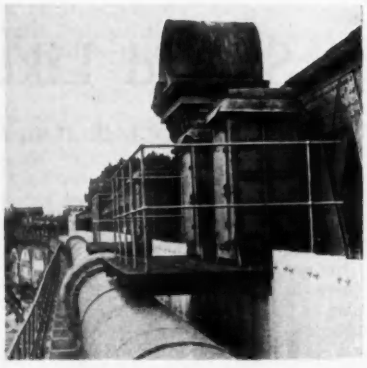
SOME FACTS ABOUT THE PIPELINE

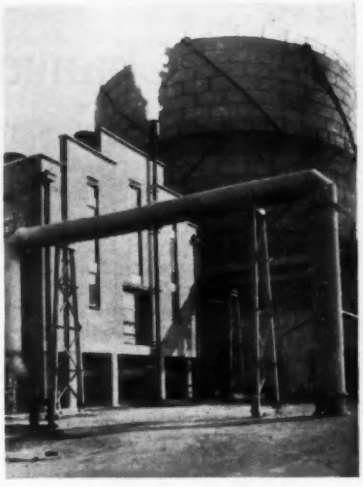
Cost	£1,160,000
Length	25 miles, 415 yds.
Bore of pipe	36 in. and 30 in.
Quantity of gas deliverable at Slough	20 mill. cu.ft. daily
Pressure	5.6 lb. per sq. in.
Total weight of cast iron pipes ...	18,000 tons
Number of joints	11,150
Number of bolts	223,000

Beneath the Railway

To pass beneath the Western Region main line at Langley, Bucks, the pipeline changes from cast iron to steel. By arrangement with the Railway Executive (Western Region) the work was done on Sundays, and rail traffic was diverted from one set of lines to another as the work required. From Langley to Slough gasworks the pipeline follows the Slough branch of the Grand Union Canal for about ¼ mile, and in laying the pipes the Board enjoyed the co-operation of the Waterways Executive. A picturesque part of each day's work here was the arrival of a tug with a string of barges which were used to remove surplus spoil.

Inlet and outlet connections to the pumps at Richmond





Left.—Special rectangular pipe over the River Colne

Centre.—The pipeline and catwalk at Putney Bridge

Right.—The pipeline terminal at Slough

Normally the gas received from Fulham will be stored in gasholders at Slough works before being re-pumped westwards or delivered direct to consumers. However, by the use of valves, it can be sent straight on direct to Windsor, Maidenhead, and Cookham.

MR. MICHAEL MILNE-WATSON, C.B.E., Chairman of the North Thames Gas Board, speaking at the luncheon at the Clarendon Restaurant, Hammersmith, after the inauguration ceremony, said that over a number of years the old Gas Light and Coke Company, now incorporated in the North Thames Gas Board, had been building a gas grid in Greater London to supply gas throughout its densely populated area from its main manufacturing stations which lay along the banks of the River Thames. After nationalisation, the Board had been at pains to extend this grid in order to cover the enlarged area of supply, and Sir John Maud's opening of the Fulham-Slough main completed what was now the largest capacity gas grid in the United Kingdom.

The underlying principle behind the grid was to make the gas where it was cheapest to do so—*i.e.*, on the River Thames with seaborne coal. With the opening of the Fulham-Slough 25-mile pipeline the grid was so complete that gas could be pumped from the great riverside works at Beckton, Bromley, Nine Elms, and Fulham, and carried to the new industries and housing estates at places as far distant as Shoeburyness, Brent-Wood, Edgware, High Wycombe, and Maidenhead. There were of course other, and most important, gasworks in the area and these were also linked to the grid so that continuity of supply was ensured.

This particular portion of the grid was planned five years ago when the Board had evidence of the growing demand in East Berkshire and Buckinghamshire. The main had to be carried twice over the River Thames, with a special cantilever structure at the Putney crossing. It went under the tidal Beverley Book, through fields and commons, through London streets and country lanes; not perhaps as deviously as Chesterton's rolling English roads, nor in fact made by a rolling English drunkard.

He welcomed the opportunity to give credit to the engineers, surveyors, draughtsmen, and all others who had designed and built the main. The chief responsibility had lain with the Board's two Distributing Engineers, Mr. H. J. Escreet, who retired last year but was with them that day, and Mr. A. D. L. Copp, his successor. Credit and thanks were due also to

Some of the chief personalities at the inauguration

the contractors who had worked so closely, helpfully, and harmoniously with the Board's staff, particularly William Press & Son, John Cochrane & Sons (East), Ltd., Carter Horsley (Engineers), Ltd., and British Thomson-Houston Co., whose representatives he welcomed.

The main passed through four counties, two Metropolitan boroughs, four municipal boroughs, three urban districts and one rural district, and many members and officials of those local authorities were present; he thanked them personally for their co-operation. He also thanked the British Transport Commission for its help in allowing the main both over and under its railway lines and alongside its canals.

Also present were the Chairman of the Gas Council, Sir Harold Smith, their guide and friend, and the Secretary, Mr. F. G. Brewer, both always ready with encouragement and help. In spite of good planning and execution the work could never have been carried out without the help of their godparents, the Ministry of Fuel and Power, who had assisted throughout in obtaining sanctions, materials and getting them over a thousand other difficulties. His thanks were due to the Ministry.

Sir John Maud turns on the gas at Fulham works

Changes I Should Like to See*

By W. S. HUBBARD, A.M.C.T., M.I.MECH.E., M.INST.GAS E.†

IN 1948 Mr. C. H. Leach, General Manager of the Liverpool Group, presented to the Institution a paper on 'Functionalism as a Tool of Management.' At the time, his address had a mixed reception from engineers, but it is true that in several areas in this country—not least in the North West—there is a trend towards the pattern of organization set out by Mr. Leach in the paper to which reference has been made.

I feel that, coming as I do from the Liverpool undertaking, I might make a few remarks on engineering development, particularly with regard to production activities during the past ten years. Engineering activities in the Liverpool Group involve approximately 1,000 operatives and some 90 technical and administrative staff employed at six works.

The works comprise four base load stations of 2½, 3, 7½ and 9 mill. cu.ft. per day, one 17/18 mill. per day and one 26/28 mill. per day station. All are interconnected and the most widely separated are 28 miles apart. Either of the two larger stations can take up peaks by C.W.G. or PG., while their coal gas equipment is also on base load operation The 17/18 mill. cu.ft. per day works is to be extended so as to produce up to 30 mill. per day without, it might be noted, any significant increase in labour costs.

The works use nearly all types of gas-making plant with the exception of coke ovens and I.V.C.s, although an installation of the latter type will be in operation in 1957/8. All the works are more or less highly mechanized and well instrumented and, as a result of integration, the minimum standby plant is carried.

The Seven-day 1941 Blitz

I joined the undertaking soon after the seven-day 1941 blitz, when its properties had suffered severe damage. The extent of the damage is not generally known and it may be of interest to note some of the events that took place during this period and also to record that, as a result of the efforts of all concerned, the gas supply virtually never failed. What is more, the customer goodwill which the undertaking had, by 1939, established after severe competition from the municipally-owned electricity undertaking, was never lost. In the first place the engineer's offices, covering about an acre, were completely gutted as a result of incendiary fires; three holders were demolished, and at one time 19 of the 25 holders were out of service. A land mine hung for five days from the roof trusses of the largest holder, and two further land mines fell on Linacre—the largest works—one of which completely demolished the ¼-mill. per day coal test plant. It is reported that as time went on the staff dealt with incendiaries almost as a matter of routine. It is an understatement to say that this damage, together with unavoidable delays in maintenance, did not improve the appearance of the works. It is pleasing to be able to record that the morale of the staff and workmen—under the command of the then Chief Engineer, Mr. E. Astbury—was never broken and that fortunately no lives were lost.

At vesting date the Liverpool undertaking was so organized that it was a simple matter to integrate it with the wider system of the North Western Gas Board. Thus the distribution system of the Liverpool undertaking is already connected via St. Helens Group with that of the Manchester Group, and within the next 18 months will also be connected with that of the Wirral Group via a main running through the lower section of the Mersey Tunnel. When this work is complete there will be a connection from Chester, via the Mersey Tunnel, and the East Lancashire Road, involving the South Lancashire, Manchester and North Cheshire Groups, as far as Buxton. The four original works at Liverpool had in 1939 been for many years connected by a messenger main system. The joint operation of the works was on a basis which reasonably fulfilled the requirements and circumstances of those days; each works was independently operated and managed; the advantages of base load operation had not been exploited.

The new policy for plant operation was to run as much plant as possible, on all the works, under base load conditions, for the greatest possible part of year; to take up peak load variations at one works at a time; to introduce a system whereby surplus gas could be moved between the respective works and holder stations as and when required, and at the same time to use the existing messenger main system to improve district gas distribution.

At an early stage in this development a central information room was set up in the city in which arrangements were made to obtain hourly, daily, and weekly manufacture and delivery data for the whole of the area. The central information room eventually became the central control room. Control room responsibility as far as manufacture is concerned is that of the production engineer, and for the dispatch of gas that of the distribution engineer. As gas production is governed by a rigid specification of product laid down by Parliament, no gas may be moved from any station if production staff are not satisfied that it is of the requisite quality. Production responsibility is therefore paramount, and this is particularly so when storage capacity is kept down to a minimum and fully employed. To this system was later added the method of remote control of boosters and holder valves and the automatic transmission of information of gasholder stocks, pressures, etc. A description of the control room was given in a paper which was presented to the Manchester Juniors by Mr. F. Bell, in May, 1945.

Statistical Section

As the instrumentation of the control room proceeded a statistical section was introduced into the organization as one of its main complementary functions. One of the earliest surveys carried out by this department was a study of customer demand and its relation to atmospheric temperatures over a number of years. With the information so obtained it was possible to introduce a forecasting system of such value that the control room facilities became a feature in the operations of the production and distribution engineers. A description of this work was given by our first statistician, Mr. A. Wild, in a paper to the Manchester Juniors in May, 1946, and the subject is under constant review by our present statistician, Mr. B. G. H. Clegg, who read a paper at the recent North Western Gas Board Area Conference.

While the work was proceeding, a study of the integration of the service functions of the production department was undertaken and a system of centralized maintenance was introduced. Works maintenance is a highly important and expensive business the success of which is essential to the continuity of gas manufacture. There are two ways of dealing with maintenance: one is to spend large sums of money on standby plant, and the other is so to organize maintenance that the amount of standing capital may be kept to a minimum. The latter policy was pursued in the Liverpool undertaking since it is by far the most economical and efficient.

The centralized maintenance department was formed as a separate organization with its own premises and engineering staff. Its services are available to all departments, but, as by far the largest and most varied demand arises in the production station, it is directly responsible to the production engineer, though each station has its own maintenance staff which deals with routine and running maintenance. The main function of

* From the Chairman's Address to the Fifth Annual Meeting of the Manchester and District Section, Institution of Gas Engineers, April 29, 1955.

† Production Engineer, Liverpool Group, North Western Gas Board.

the central maintenance department was not to set itself up as a factory prepared to manufacture plant, but to deal only with all peak load maintenance and major repairs on all works, and such functions as could conveniently be centralized.

It will be obvious that, although the central maintenance department is available for dealing with peak load maintenance and occasional operational repairs on the works, it could itself encounter peaks in demand for its services, and for this reason the department puts out to contract any work outside its normal range with the object of keeping the number of staff down to a minimum.

The general policy at all times has thus been to employ outside organizations for those very special services which they are better equipped and more competent to perform.

The chemical department and its method of operation also came under review. Each works had heretofore had a laboratory, the staff of which was controlled partly by the works manager and partly by the chief chemist. The works laboratories were frequently involved in testing which could with advantage have been done centrally, and, because suitable facilities were lacking, special chemical investigations were seldom undertaken. The central laboratory was therefore transferred to new and larger premises. At the same time the works' chemists, operating under qualified principal chemists, were made directly responsible to their respective station engineers and were henceforth more directly involved in plant operation. Chemical problems, special investigations, plant testing and the like were passed to the chief chemist who now possessed facilities for this type of work. The central chemical department is responsible for the general oversight and maintenance of instruments throughout the Group and an instrument section, headed by a qualified instrument engineer, is therefore attached to the central laboratory. Each of the larger works also has an instrument assistant whose duty it is to carry out running maintenance.

Also included in the production department's organization is a central drawing office which deals with new development work and provides drawing office and design services for the various works. In operating a drawing office of this kind it is essential that any developments of, or alterations to, works plant are discussed with and approved by the person responsible for its operation.

There is no doubt that the changes described served to indicate many fruitful and interesting lines of progress. For example, a reasonable index of works productivity is perhaps the gas made per manual employee expressed in thousand therms per annum. The average for the gas industry in 1953-54 was 45, the lowest being 28 and the highest 56. In the same year the Liverpool figure was 66 and the latest is still higher. Productivity is thus 50% higher than the national average. At the commencement of the Liverpool Gas Company integration in 1943 our figure was 32. A further example of the effect on all-round efficiency is the thermal value of works services—steam, electricity and gas used—expressed as a percentage of the total thermal value of raw materials, coal and oil. In 1945 this index was 6.35%; in 1954 it was 1.84%.

The storage capacities of different works might be expressed as hours storage at the average rate of delivery, an index which gives a reasonable basis of comparison provided that good pressures are constantly maintained and there is no standing off of coal plant. If these two conditions are not satisfied, of course, the most backward undertaking could produce the best index. In 1953/54 the figures for the 17 groups of the North Western Gas Board averaged 22.8 hours, the highest being 30.9 and the lowest (that of the Liverpool Group) being 18.7. Taken with the fact that district pressures are virtually constant at 45 tenths and have never been cut and that standing off of coal gas plant at any time is a thing of the past, the very low storage figures give some idea of the effect of integration in this respect. Centralized control of an integrated system also means that it is possible at short notice to give technicians an opportunity of training and gaining experience at various works.

One of our most interesting technical activities has been the employment of mechanical producer plants for heating retort settings and for providing peak load gas in conjunction with carburetted water gas machines. An account of this work was given in my paper to the Institution in 1950, but some more recent news is of interest. The use of mechanical producers for heating retort settings has been justified in so far as it has served to control the coke market and in certain circumstances to reduce the fuel consumption of, and make improvement in, carbonizing plants. Their use has been successful also in that the laborious method of handling step grate producers has been eliminated and possible labour difficulties in this quarter have thereby been avoided. I might mention here that greater use of mechanical producers gasifying coal for heating settings is more than likely in the future; and no new plant developments should be made without bearing this fact in mind.

Where the use of mechanical producers involved the supply of hot gas, some difficulty was encountered in cleaning by normal methods. Experience has shown that correctly designed single unit cyclone cleaners are completely satisfactory where the gas is to be fed direct to burners; but where gas is to be fed into recuperators some difficulties arise. It must be accepted that cyclone cleaners cannot satisfactorily deal with particles of very small size—*i.e.*, below 10 microns or thereabouts. Nevertheless, some of the smaller particles are removed, the proportion varying in an unpredictable manner. In any case, gas so treated may be regarded as clean enough for all save the most exacting conditions. Mechanical producers can be operated satisfactorily on all grades of fuel provided that the dust fraction is removed.

Where gas is fed into horizontal settings via recuperators it is generally found that formation of very fine carbon particles —virtually soot— results from the cracking of small amounts of volatile matter remaining in the coke. The residual volatile matter appears always to be associated with the smaller sizes of coke from horizontal settings and probably derives from the slightly under-carbonized end portions of the charge. Carbon resulting from this 'cracking' process is extremely fine and voluminous in nature and may cause blockage in recuperators. Difficulties may therefore arise from apparently negligible amounts of volatile matter, the removal of which it may not be possible to ensure.

Tests made in 1954 showed that the percentage of volatiles in No. 1 coke varied from 1.5 to 1.7 for vertical plants and from 1.5 to 2.0 for horizontal plants, whereas in No. 4 coke the percentages were for verticals 3.2 to 3.6 and for horizontals 4.5 to 6.8. These figures illustrate the way in which volatile matter is concentrated in the breeze portion. The breeze cannot be entirely removed by screening and the difficulty can only partially be overcome by arranging to replace horizontal coke fed to hot gas producers by, say, vertical coke, when immediate improvement results.

Further information regarding the installation of horizontal chambers at Linacre is now available after four years working. It will be recalled that this installation enabled us to obtain an increase in output of some 50% on the site concerned. The calorific value of the gas produced in the plant is consistently of the order of 600 B.Th.U. per cu.ft.; by this means we have been enabled to increase the volume of blue water gas produced. This fact has a special significance as the cost of blue water gas is, of course, relatively low and it has thus been possible to reduce the cost of manufacture at Linacre. This plant is to be the subject of further tests this summer. It would seem that there will always be a place in the gas industry for a carbonizing plant capable of producing high calorific value gas regardless of the coal with which it is supplied. The Linacre installation comes within this category.

The manpower requirements for such a plant compare closely with those for up-to-date continuous vertical installations of the same thermal output. It was anticipated when the plant was first installed that repair charges would be comparatively low, and experience to date gives us no reason to alter this view.

If we were to instal such a plant in the future, the opportunity would be taken to consider the possibility of handling the hot coke discharged in bulk rather than by conveyor systems. Bulk coke handling and quenching could be so arranged as to be much quicker in operation and to give improved working conditions.

The producer gas in this installation is completely cleaned after cooling in Lymn washers. The water consumption for this purpose on a plant of this size is extremely large and it is necessary to employ a circulating system. As one might expect, dust removal has caused considerable trouble because, even after wetting, the dust is slow to settle and efficient settling ponds would be of very large area. It is desirable

in these circumstances that as little dust as possible should find its way into the water circulating system, and this object may be achieved by installing cyclone cleaners before the Lymn washer.

The liquid purification plant at our Linacre Works was described in detail by Mr. L. G. Townsend in 1953, and its performance is at present completely satisfactory. The circulating liquor in the plant (which is still operating on horizontal coal gas) contains considerable proportions of cyanogen compounds which assist in the satisfactory operation of the process.

No corrosion difficulties of any kind have arisen, and it is now believed that they are not likely to do so. During its five-and-a-half years working the plant has purified over 5,000 mill. cu.ft. of gas with an average H_2S content of 650 grains per 100 cu.ft., and has thus removed over 2,000 tons of sulphur. The capacity of the plant varies somewhat, depending upon the development of the complex cyanides in the circulating liquor, but it can, under average conditions, handle 3½ mill. cu.ft. per day. Some difficulty has been encountered with gradual blockage of the board filling in the towers, but this is being overcome, with very little falling off in performance, by the use of wider board spacing. A sulphur recovery process, involving coagulation followed by filtration on a rotary vacuum filter, is still being used with success, and the resulting sulphur, containing 25% to 30% of water, is dried by hot air in an agitator.

One installation at Liverpool was the Holmes-G.L.C. benzole plant which was put to work at Garston towards the end of 1946. The design is based on that of the original plants installed by the then Gas Light and Coke Company at Kensal Green, Brentford, and Southall, but the Garston installation was unique in that it was the first of its kind to be completely electrically driven. The use of electrical drives called for more than average attention to safety precautions. It was arranged that the plant should operate without special provision for supervision. An elaborate alarm system was therefore installed, operating at an already supervised central instrument panel.

The plant has been completely successful and has given no serious trouble. It has washed 15,000 mill. cu.ft. of mixed horizontal and vertical coal gas, recovering thereby over 3½ mill. gal. of benzole. The gas oil used amounts to only 2.4% of the benzole made. The low pressure steam is 55 lb. per gal. and the electricity consumption is rather less than one unit per gal.

The operating time lost for the purpose of maintenance amounted to only 6% of the time worked. Maintenance charges are extremely low and average under £400 per annum —*i.e.*, less than 0.24d. per gal. It has been found profitable to concentrate the Group's benzole recovery at this plant. Its operation has resulted in a reduction of the organic sulphur compounds to about 13 grains per 100 cu.ft.—about half the normal figure. When the plant was installed provision was made for duplication of certain items so as to allow for the future treatment of 20 mill. cu.ft. per day, and this will cater for the additional gas to be produced in a new I.V.C.O. plant.

Control of H_2S removal at Liverpool has been greatly assisted by the development of the Liverpool Thermocontrol H_2S recorder. This instrument has been particularly valuable on the liquid purification plant where a continuous record is almost essential. It is normally provided with contacts which can be set to give alarm at any desired figure. A more recent development is the introduction of a separate, relatively inexpensive, paper change unit fitted with alarm contacts. Where rapid paper changes are being made this instrument almost acts as a recorder. The new I.V.C.O. plant is an extension to the Garston Works and consists of four 3½ mill. cu.ft. batteries by Jenkins and Co., Ltd. The capacity of the works will thus be brought up to 28-30 mill. cu.ft. per day. It is expected that this extension will be in full operation by the end of 1958.

The progress of the gas industry is at present along well defined lines, and recent developments have been occasioned largely by the continual increase in the cost of coal. Gasification of oil by catalytic or other methods has been developed because of an increase in the coal/coke price ratio and shortage of coals suitable for existing plants. This tendency may, however, be completely reversed if the policy recommended by the Beaver Committee is put into practice.

The figures for 1953 show that of the 12 mill. tons of coke produced by the gas industry only 2.7 mill. tons went to the domestic customer, who also took 0.4 mill. tons of oven coke. There exists a potential demand for at least 6 mill. tons of coke which, if produced by the carbonization of a further 10 mill. tons of coal, would go a very long way towards clearing up pollution arising from the domestic grate. It is essential in this connection to realize that the extra gas which would be produced if existing types of plant were used would not, with the present pattern of domestic fuel usage, be absorbed. A new market for some 900 mill. therms of gas at 450 B.Th.U. per cu.ft. would consequently need to be created, and the most likely outlet for this would be the industrial consumer. The introduction of special tariffs favouring the 'base load' type of customer is a step in the right direction, and it should also be remembered that a steady industrial load assists in maintaining gas quality, particularly the specific gravity.

In a problem of this kind it is logical and natural to deal with the easier aspects first, particularly as they are likely to produce the most spectacular results. Improving the quality of coke to a stage where it is combustible in any type of open grate constitutes a long-term policy which may not necessarily be acceptable to the industry. On the other hand, there is a section of the community which, with suitable persuasion, will accept the installation of closed stoves of various patterns, particularly for water heating. These appliances are extremely efficient, and this fact in itself should attract many people who are now burning raw coal. Apart from their efficiency, however, these appliances have other advantages. They are not at all selective regarding the coke they burn, and its combustibility is, within wide limits, not important. At the same time there is no flying shale problem. It is nevertheless evident that the gas industry will have to devote increasing attention to the production of more and better coke, and it is well within our capacity to achieve this result.

All of us have at heart some developments which, for one reason or another, we should like to see taking place in our industry. I should like, in rounding off this venture into the future, to mention a few of the changes which I should like to see. In the first place I sould like to see on the part of the trade unions—which are now accepted as the effective medium of negotiation—a greater appreciation of the country's needs. This appreciation might be demonstrated by a determined effort on their part to allow, and indeed encourage, many unskilled workers to become skilled workers irrespective of their age, but subject, of course, to qualification. I should also like to see the trades unions, in conjunction with the employers, introduce or extend skilled classification by examination.

Continuing in this vein, but turning attention to staff as distinct from operatives, I believe that care should be taken to avoid the carrying of over-many highly paid specialist personnel, some of whom may often be fully employed for relatively short term or intermittent purposes. The solution of this problem is the greater use of suitable consultants; but in carrying out such a policy it must not be forgotten that the responsibility is two-fold. Those utilizing such services should have a clear idea of the use to which they are to be put and realize that full and accurate briefing is necessary. The employment of consultants is not a widespread practice in the gas industry, although certain area boards and undertakings have adopted it with considerable advantage. In present circumstances, with the acknowledged and growing shortage of skilled and qualified men, this policy has a great deal to recommend it, as it undoubtedly helps to make the best use of the country's resources of skill and experience.

A consequence of the growth of specialization and of the pace of modern development is the enormous amount of information which becomes available during the year. Some idea of the magnitude of the problem this causes may be gained from the fact that one publication, *Engineering Index*, lists over 50,000 separate references in each annual volume. The result is that executives are confronted with a mass of literature (much of which is valuable) which, in their more optimistic moments, they visualize themselves as having time to read. It would obviously be a great advantage if some means could be found—other than mere abstracting—of getting essential information from the literature without the expenditure of too much time. There is a need for simplification in methods of technical reporting; and this applies even more to internal memoranda than to published papers and informa-

(*Concluded on p. 457*)

Great minds think alike and install

WD

CONTINUOUS VERTICAL RETORTS

WOODALL-DUCKHAM
CONSTRUCTION COMPANY LTD.

Woodall-Duckham House, 63-77 Brompton Road, London, S.W.3
Telegrams: Retortical (Southkens) London. Telephone: KENsington 6355 (10 lines)

In the Public Service for over 40 years

When 'buses were open-topped and life, before the first world war, pursued a more even tenor than today, William Press & Son were laying mains for gas supplies in London and throughout the country. This is a service which they have continued to develop on an ever-increasing scale, so that to-day the Press organisation stands ready and equipped to meet every demand for main-laying and allied work for the gas industry.

WILLIAM PRESS & SON LTD.

for Mainlaying and Pipework to-day

22 QUEEN ANNE'S GATE, WESTMINSTER, S.W.1
Telephone: WHitehall 5731 (7 lines) Telegrams: Unwater, Parl, London

WILLOUGHBY LANE, TOTTENHAM, N.17
Telephone: TOTtenham 3050 (10 lines) Telegrams: Unwater, Southtot, London

WILLIAM PRESS & SON LTD. MAINLAYING

Large Scale Carrier Gas Carbonization in the North Thames Area*

By A. F. GRANT, M.Inst.Gas E.† and C. H. LEWIS, M.Inst.Gas E.§

We give the conclusion of this paper from last week's issue of the 'JOURNAL,' together with the discussion and authors' reply

THE costs of gas production (ex retort house) at Bow Common under the conditions realized in the various tests are shown in Table II, together with the costs for normal operation. Of the two series of tests at normal temperatures with coal gas injection, only that at the higher throughput is included in Table II. The prices used are those ruling for the period April-September, 1954, and the costs are calculated from the yields used in compiling Table I.

It will be seen that in all cases the cost of gas production was materially greater than with normal steam admission. The reasons appear to be as follows:—

(1) When injecting coal gas, the yield of gas per ton of coal is abnormally low and the net cost of coal per therm of gas is therefore high. The low fuel consumption attained in the trial at reduced temperatures does not entirely offset this, so that even in this case the net cost of coal is higher than for normal work.

(2) When injecting blue gas or mixed gas, the thermal yield of gas produced in the retort house is lower than normal. The net cost of coal is nevertheless lower because of the reduced fuel consumption. Labour requirements with the existing plant are higher, more or less *pro rata* to the quantity of coal handled, and for this reason labour charges per therm are higher. Repair, maintenance, and resetting charges are high for similar reasons.

(3) The cost of gas production when operating with blue gas injection was 9.667d. per therm, of which 1.665d. was incurred for blue gas. The yield of coal gas was 82.6% of the total gas produced, and the cost of coal gas only was consequently 9.69d. per therm as compared with a normal cost of 8.795d. In order to produce gas at 8.795d. per therm by injecting blue gas under the conditions encountered at Bow Common the retort house costs (labour, repair, maintenance, and resetting), must be reduced by about 1d. per therm; since these costs were only 1.562d. during the blue-gas trials this does not appear to be possible.

The capital charges per therm for an existing works, can only be reduced if the overall output be increased. In the previous section of the paper, an increased output is shown to be impracticable within the limits to which the carrier gas process can be operated with existing plant at Bow Common. The increase in output that could be obtained by coal gas injection, may be disregarded since the lower carbonizing efficiency would result in considerably higher production costs heavily outweighing any reduction in capital charges.

Conclusions

General conclusions may be summarized as follows:—

(1) The process can be established and maintained reliably at a considerable increase in coal throughput by normal works personnel.

(2) The change-over from normal steaming to carrier gas operation is a relatively simple technique and can be achieved in a short period.

(3) To maintain steady carbonizing conditions and a minimum loss of volatile matter to coke, coal of a uniform size and quality is beneficial and probably essential.

(4) The increase in throughput obtainable is dependent on the uniformity of coal size and quality, provided an adequate supply of carrier gas can be maintained.

(5) The injection of gas containing hydrocarbons is undesirable because a proportion of the hydrocarbons injected are decomposed with consequent loss of gaseous therms.

(6) When injecting blue-gas, the coal throughput obtainable is controlled by the permissible calorific value of the gas produced, since there is an optimum ratio of throughput to volume of gas injected.

(7) With moderately swelling coals, pressures at the base of the retorts seldom exceed 0.5 in. w.g., but the present design of retort bottom brickwork is not adequate to withstand this pressure.

(8) With the existing design of top ironwork, the conditions of the charge at the top of the retort at high throughputs may become difficult and rodding unduly arduous for personnel. Unreliable coal travel will therefore result.

(9) There is no appreciable change in the size range of coke produced. The volatile matter in the coke is an important feature of process control.

(10) Tar yields, though difficult to measure accurately over short periods, increased by some 20% at the higher throughputs, representing an unavoidable loss of gaseous therms.

(11) Labour requirements during these trials increased almost *pro rata* to coal throughput.

(12) Economy in fuel consumption would seem to be in a rough proportion to increased coal throughput and the normal retort installation is capable of generating and utilizing the increased quantities of producer gas required up to at least 60% increase in coal throughput.

(13) Operation at normal throughput with reduced temperatures is worthy of further investigation, producing gas at a low calorific value, to determine the most effective conditions of setting heats and carrier gas/coal ratio to give a minimum fuel consumption. The implications of gas condensing and steam production under these conditions could be studied with advantage.

(14) In considering the application of the process the performance of exhausters and wet and dry purification plant to deal with the total gas must be examined.

(15) It may be stated in general terms that a retort on carrier gas requires to be supplied with a uniform quality of raw material, operating controls must be adjusted accurately to suit that material and, generally, more detailed supervision is necessary to maintain the constancy of the predetermined operating conditions. Any variation from these conditions at high output will result in a greater falling away from optimum efficiency than is the case at normal outputs.

(16) With gas at a declared calorific value of 500 B.Th.U. the thermal output at Bow Common can only be increased by injecting coal gas, and under these circumstances the cost of gas production is materially increased. When injecting blue gas, the thermal output of the works is decreased and the cost increased. The conditions of coal supply and calorific value make this process unsuitable for the North Thames Gas Board.

DISCUSSION

Dr. J. Burns, G.M, North Thames Gas Board, opened the discussion. He paid tribute to the Glover-West organization, which in September, 1953, introduced the practical aspects of this interesting work to him, and gave him the opportunity of introducing it to his own Board. They had considered the work to be of sufficient interest to start experimentally, more or less immediately on a two-retort scale, to be followed up quite quickly by work on a real full-scale basis of 34 retorts.

Dr. Burns said he would limit his discussion very briefly to the practical application of the carrier gas principle to

* From a paper to the London and Southern Section of the Institution of Gas Engineers on April 19, 1955.
† Station Engineer, Bow Common.
§ Research Chemist, Fulham.

see just where it did take them in the process of coal carbonization. He looked at it first of all from the point of view of gas production, and he thought they learned that, provided always the calorific value of the gas required was in the region of 450-460 B.Th.U., they could materially and without undue loss in efficiency, increase the coal throughput and the gas production from a given setting of retorts. He thought they had got to be very careful indeed about the claims for the percentage increase in throughput for in the North Thames Gas Board they were accustomed to operating their retorts at the highest possible throughput concomitant with economic results; for instance they expected normally to get a throughput of nine tons per day from an 82 in. W.-D. retort making gas of 520 B.Th.U. per cu.ft. from Yorkshire coal. This compared with the seven tons per day one was likely to get at 450, and they saw from the results in the paper that carrier gas could increase the throughput at 450 to somewhere in the region of 14 tons per day. In other words they were able to get a 50% increase in coal throughput. The extent to which they could continue to get those increases must depend very clearly on the ability of the retort to withstand the higher gas pressures which of necessity accompany carrier gas operation. One had to remember, after all, that the continuous vertical retort was a refractory vessel and not designed to withstand pressures very much above a few tenths of an inch w.g. In the course of the experiments at Bow Common they experienced quite severe difficulties arising from leakage of gas at the base of the retort.

This increased throughput was undoubtedly dependent, too, on coal and coal quality. He thought, in general principle, that any inherent difficulties in coal travel were increased with increase in coal throughput and they could not always afford to select finely graded coal for this type of work, for there was not always sufficient to go round, and any process that could hope to be successful at the present time must be almost omniverous in its taste for gasmaking coal.

Dr. Burns continued that they were not, however, particularly interested in gas at 450 B.Th.U. It would not pay them economically to go back to such a low calorific value, and their interest was in gas at 500 or higher. When they came to operation at high calorific values they required to use coal gas with its hydrocarbons as the carrier gas medium and there they immediately came up against the difficulty of hydrocarbon degradation which, in the work at Bow Common, showed a 14% loss in therms per ton. At this level of loss, the costs, of course, were very heavily weighted against the carrier gas process.

Looking at the process in the light of coke production, Dr. Burns said this was of special interest in view of the Beaver Report. The carrier gas process as such had no effect whatsoever on coke production per unit of gas requirement. The output of coke at 450 B.Th.U. gas was a good deal less than the output of coke per unit of gas at 500 B.Th.U. It was true that the quality of coke was likely to show some improvement over normal continuous vertical retort operation and this was a factor which had to be taken into account.

Dr. Burns said he thought that, quite clearly, labour conditions in the retort house were not likely to be so good on carrier gas operation as on normal operation but, in this connection, they should look to the very interesting work carried out by the North Western Board at their Partington installation where they had mechanized some of the more distasteful items of continuous retort operation with, in his opinion, a considerable degree of success.

They should not unduly despair at the inability of the carrier gas process to produce gas at 500 B.Th.U., but rather seek means by which it could be used in association with the production of gas at 500 B.Th.U. He thought it was of interest to take three examples of doing that and compare their raw material requirements and their costs. As an example, the production of 40,600 therms of gas per day—that happened to be the amount of gas produced from two standard 4 mill. cu.ft. per day continuous vertical retort installations with benzole extraction. The three possibilities were:

(a) One 4-mill. unit of coal gas operating on the carrier gas principle at 450 plus enrichment by Hall gas at 1,000 B.Th.U. to give a mixed gas of 500. The costs of this were 10.871d. per therm, while the coal used was 396.6 tons; the oil used was 6,466 gal. with coke and breeze produced for sale at 198.1 tons per day.

(b) One 4-mill. unit of coal gas plant making gas at 512 with carburetted water gas added at 488 C.V. to give a mixed gas of 500. In this case the costs of production were 10.078d. per therm while the raw materials used were 273 tons of coal and 10,469 gal. of oil with the production for sale of 99.3 tons of coke and breeze.

(c) Two 4-mill. units of coal gas plant at 512.2 C.V. with benzole extraction to 500. In this case the costs per therm were 10.268d., if no profit or loss on benzole were assumed, or approximately 10d. per therm with the present-day profit on benzole, with the coal usage of 568 tons and the production for sale of 721 gal. of benzole and 344 tons of coke and breeze. (All the above costs included capital charges).

Thus, under the conditions obtaining in the South of England at least, the normal methods of producing 500 B.Th.U. gas either by coal gas and water gas or by coal gas with benzole extraction, provided a cheaper system than carrier gas and rich oil gas. These conditions, however, might not be the same throughout the country and it might be worthwhile to consider this exercise for different economic conditions up and down the country.

Sensible Heat from Incandescent Coke

Dr. S. Pexton, Senior Fuel Chemist, North Thames Gas Board, pointed out that these full-scale experiments, at Bow Common, once again emphasized the difficulties of recovering sensible heat from the incandescent, consolidated mass of coke as it gravitated through the lowest zone of the retort, in its approach to the coke extractor. He had drawn attention to this problem in his paper 'Fuel Requirements of Carbonizing Plant,' in 1943, when he estimated that of the 10.6 therms per ton of coal of sensible heat in the caked charge at the end of carbonization, some 2.75 therms could be recovered in superheating steam and supplying endothermicity for the production of 12 therms of blue water gas; three therms could be utilized in preheating the secondary air, contributing directly to a substantially reduced fuel consumption; leaving an unrecovered loss of nearly five therms per ton of coal in the coke entering the coke box. This compared with 11 therms per ton of coal lost in the ascendant plumes of steam rising from the coke quenching towers of intermittent systems of carbonization such as horizontal retorts, intermittent vertical chambers and coke ovens.

In discussion of his 1943 paper, Dr. A. E. Haffner had doubted whether the endothermicity of the water gas production within the retort could be wholly satisfied from sensible heat recovery from the incandescent coke. He had thought that some water gas was produced at a higher level in the retort from reaction between the steam and the outer skin of coke. Dr. Pexton's present view was much in accord with that of Dr. Haffner. His (Dr. Pexton's) former view regarding the usefulness of cooling the bottom ironwork and the base of the retort with secondary air, still held, even though some of the preheat acquired by the secondary air might not have come from coke within the retort but from adjacent producer gas cross-over flues or combustion flues. Further external cooling of the base ironwork and of the coke boxes was still needed and the use of heat so recovered in the primary air to the producers might still prove worthy of application.

In continuous vertical retorts it was doubtful whether the whole cross-section of the charge, at the end of distillation, say four-fifths of the way down the retort, was entirely at 1,000°C., although 6 in. within the coke near the ends of the retort it might be at 1,080°C., as shown by Dr. F. R. Weston ('GAS JOURNAL' Vol. 250, p. 556) in 1947, with multiple metal tallies, prior to quenching two retorts at Bow Common, in 1945-46. It seemed probable to Dr. Pexton that under present conditions of maximum throughput, and with limited steaming, carbonizing temperatures fully as high as in intermittent systems were not achieved and the amount of sensible heat recovered from the coke as preheat for secondary air or for water gas reaction might be rather less than his former assessments. Dr. Pexton said he had re-stated these aspects of continuous vertical retort practice because of the popularity of this form of carbonizing plant in many British gasworks. That popularity rested upon the following merits: (1) High output per unit site area; (2) excellent amenities and closed quenching system; (3) low fuel consumption; and (4) ready combustibility of the coke in open fires and domestic stoves.

Intermittent systems of carbonization found their coke more

suited to large commercial and industrial furnaecs, as exemplified by high capacity water gas generators or even blast furnaces.

Although the quenching of the coke from continuous vertical retorts was more satisfactory than from intermittent vertical systems, the five therms per ton of coal lost in the coke boxes of continuous vertical retorts was still substantial. It might not be sufficiently realized, said Dr. Pexton, that the internal quenching of coke within the water-sealed coke box of a W.-D. retort was so dependent upon the evaporation of substantial quantities of water from water sprays, the overflow from which feeds the bottom door seal. This was so important that in other continuous vertical retorts with dry sealed bottom doors, water sprays had now been installed in the coke boxes in order to ensure complete quenching of coke and cooling of iron work. This created new problems in ensuring continuity of water supply and correct drainage of excess water without in-leakage of air.

When Dr. Pexton had first learned that the North Western Gas Board, West's Gas Improvement Co., as well as his own Board, were operating the carrier gas process, he was delighted, because here was a possibility that more of the sensible heat of the incandescent coke might be transferred internally from the coke at the base of the retort to the coal undergoing carbonization at the top of the retort, than was possible by normal steaming. It seemed to him from the evidence presented by Mr. Grant and Mr. Lewis that under their conditions of limited steaming, or limited carrier gas circulation, as required by their final declared C.V. of ' 500,' the quantities of carrier used were insufficient to cool the consolidated coke mass before it reached the extractor, and that the difficulties of penetrating the plastic coal layer in the upper parts of the retort were such that the expected benefits had not been fully attained. Perhaps if they had been dealing with non-aggregating lump coal in which the use of increased quantities of carrier gas could penetrate the unagglomerated pieces of carbonized fuel, and if in turn the hot gases could fully penetrate between the pieces of coal at the top of the retort, then the results might well have been more attractive. Under these conditions, however, the coal gas production yields expressed as hydrocarbon enrichment values would no doubt have suffered materially, partly by reason of much increased yields of primary tar. If at any future time experiments were contemplated with non-swelling non-caking coals then he would recommend the use of *dry* coke boxes and high rates of injection of cooled blue water gas.

Dr. Pexton concluded that it was now clear from the recent experiments at Bow Common, that re-cycling purified coal gas to the base of the retorts, even at somewhat reduced combustion chamber temperatures, caused degradation of ethane and gaseous unsaturated hydrocarbons with a consequent loss of hydrocarbon enrichment value and a much increased quantity of materials to be processed per unit of gas production.

Dr. Foxwell's Question

Dr. G. E. Foxwell, Past-President, Institute of Fuel, asked whether the authors could explain precisely why the rate of carbonization was increased when using carrier gas, but was decreased when using steam, even when the amount of steam used was comparable in volume or in thermal capacity, as regards sensible heat, with carrier gas. In each case the hot coke at the bottom of the retort supplied sufficient heat to ensure that steam and carrier gas were each in effect superheated gases. The endothermic reaction due to the formation of water gas did not seem from such rough calculations as he had made, to account for the difference in behaviour.

There was the further fact observed by the authors, when changing from steam to carrier gas, that the flue temperature at the base of the retort was immediately reduced. This indicated that carrier gas sweeping over the sides of the retort absorbed and carried heat up the retort faster than did steam of the same order of thermal capacity or volume. He felt that the mechanism of the carrier gas process as compared with the steam process was unexplained and he asked whether some precise and mathematical analysis could be undertaken to indicate the true mechanism of the process.

It appeared to him also that since the plastic layer in a continuous vertical retort was in the form of an inverted cone the faster heat transfer would be mainly secured by the gases sweeping over the outside of the plastic layer. It might be that with the movement of the coal the plastic layer in a continuous vertical retort would be more permeable than in a static retort. Moreover, the faster rate of carbonization at the top of the retort secured by carrier gas would cause the coal to become more plastic, and therefore more resistant to the passage of gases. He suggested that when carbonizing coals of lower rank in a continuous vertical retort the plastic layer would be permeable through the formation of gaps, but when carbonizing a Durham coal the plastic layer would be less permeable. He felt that in this lay the reason why so much higher throughput could be secured with Yorkshire coal than with the more highly caking Durham coal under carrier gas conditions.

A Personal Interest

Mr. M. S. Gaskill, West's Gas Improvement Co., expressed his personal interest, since his Company had done a considerable amount of research on the carrier gas process. This work was carried out on one full-size retort as described in the publication referred to in the paper. While a single unit had many advantages for research purposes, the translation of the results to those which could be obtained on a large installation operating under normal conditions presented difficulties, particularly in the economic aspect. It involved certain assumptions and was not necessarily a matter of simple arithmetic. The opportunity to compare results so obtained against full-scale operation was, therefore, very valuable and the results given in the paper were in close agreement with their own findings.

Obviously, the purpose of the paper was to report objectively on the application of the carrier gas process to a particular plant under existing circumstances and it was clear that application of the process and its economics must be examined in each particular case.

In view of this he proposed to confine his comments to the authors' conclusions and general observations. It was interesting to note that emphasis was placed on the uniformity of coal size and quality. In their approach to this process they had in mind the possibility of the use of inferior coals from two points of view.

First, the possibility of improving the quality of coke from poor, low coking coals, a possibility which did not materialize. Secondly, the possibility of blending coals. This, of course, said Mr. Gaskill, involved the reduction in the size of the coal and it was hoped that the use of carrier gas would overcome the reduction in throughput which occurred when very small coal was carbonized. Their (Wests') experiments indicated that this objective could be in some measure attained but only with considerable operational difficulty. This difficulty could probably be overcome by pretreatment of the fine coal as, for instance, some form of briquetting. Briquettes had on a number of occasions been carbonized in continuous vertical retorts, but unless the coal could be purchased and the coke sold under very advantageous price conditions, the cost of briquetting, etc., would render the economics of the process doubtful.

There was no doubt that the use of coal gas as a carrier gas under normal operating temperature conditions was unsatisfactory, and while from the point of reduction in capital charges this system appeared the most attractive, the resulting losses as the authors stated, through hydrocarbon decomposition, outweighed any saving in this respect.

With blue water gas the process showed little or no advantage at comparatively high calorific values. At lower calorific values of gas considerable increase of coal throughput was obtainable, but the capital and operating costs of the blue water gas plant must be taken in consideration. Under those circumstances, the consideration was basically a question of carburetting blue water gas with either oil in the normal manner, or with coal by the carrier gas process and in this connection the availability of the extra coal required was obviously a paramount factor.

Moreover, since the water gas plant became a base load plant for the operation of the carrier gas process, adequate standby equipment was essential, with consequent increase in capital cost. As an example, alternative schemes for a normal carbonizing plant and a carrier gas installation, the latter suitably modified to deal with additional coal and coke

per retort, and including all essential water gas plant and auxiliaries, showed that the capital cost of the normal plant was approximately 7% lower.

Operation at Lower Temperature

Mr. Gaskill then turned to the section of the paper dealing with operation at low temperatures. His Company's experiments had shown that to avoid decomposition of the carrier gas, temperatures much lower than those employed by the authors, were essential. It was suggested that at the temperatures stated, a higher throughput of coal could have been maintained with advantage, and the authors would perhaps comment on that point. To eliminate decomposition, it would appear that combustion chamber temperature of 900°C. to 1,000°C. must not be exceeded. With those temperatures and under favourable conditions, a throughput approaching nominal could be maintained. While this resulted in an increased coke yield, the calorific value of the gas made was high and a source of dilution probably involving the use of a proportion of this coke yield would be necessary. As a possible solution, the use of a mixture of coal gas and steam at higher temperatures had been investigated. Under those circumstances, the reforming of a certain amount of methane could be effected, thus controlling the calorific value, but while the coke yield was thereby increased, a loss in gaseous therms obviously occurred. It was not suggested at this stage that either of the foregoing suggestions were commercially practicable or economic.

The Authors' Reply

The **Authors** were very appreciative of the points made by Dr. Burns which put their work on the carrier gas process in very clear perspective in relation to normal methods of carbonization, particularly under existing conditions in the South of England. The mechanization of certain operations in the retort house would be undoubtedly of particular benefit to the process and might be desirable also for normal operation. Dr. Burns had referred to the necessity for defining the base-line when calculating increases in throughput, and it had to be remembered that while a throughput of 14 tons per day represented an increase of 100% above the throughput of seven tons normally obtained when steaming to produce gas at 450 B.Th.U. per cu.ft., it was only equivalent to an increase of 55% above the throughput of nine tons obtained when making gas at a calorific value of 512 or more.

Dr. Pexton had again given an insight into his remarkable knowledge of the carbonization process and his contribution was very valuable in the context of carrier-gas operation. While the desirability of preheating the secondary air at the base of the retort was still obvious it would appear that the problem of the tightness of the retort in this zone for carrier gas or normal operation required consideration from the design standpoint. With regard to the rate of carrier-gas circulation it was not necessarily a practicable possibility to inject carrier gas at any desired rate. The work had shown that, for a particular coal and a given throughput, there was an optimum rate of carrier-gas injection irrespective of final gas C.V. Moreover for a given coal there was a potential maximum throughput which could be achieved by the carrier-gas process. While adjustment of combustion chamber temperatures and modification to the method of feeding coal into the retort might permit some increase in carrier-gas rate, it would still seem that the plastic layer conditions for a particular coal would limit the final degree of heat transfer possible from the carrier gas, and therefore impose a limit on the volume injected. Also, as Dr. Pexton had pointed out there would be a loss of gaseous therms to primary tar.

Dr. Foxwell was probably correct in his suggestion that the permeability of the plastic layer was the controlling factor which determined the maximum throughput obtainable. When carbonizing a strongly-swelling run-of-mine coal it was most unlikely that the pastic layer could be penetrated to any extent by the carrier gas, and the increased throughput obtained in the Kensal Green tests was probably due entirely to the increased rate of heat transmission from the retort wall to the charge as a whole. The magnitude of this was shown in the paper; there was an increase of 33% in the rate of heat transmission at a depth of 16 ft., and an increase of 10% at a depth of 8 ft. On the other hand, when carbonizing a less strongly swelling coal, consisting mostly of nuts, the plastic layer would be discontinuous, and the carrier-gas could penetrate more readily into the charge and so give a further increase in the rate of heat transmission. Dr. Foxwell might also be correct in assuming that the thermal capacity of the carrier-gas was comparable with that of the steam; the authors felt that the explanation for the increase in throughput was related to the endothermicity of the water-gas reaction.

[In a written reply to Dr. Foxwell's contribution, Mr. Lewis added a further note on the heat requirement of the process, as follows:—

The manufacture of 500 B.Th.U. gas by steaming involves the introduction of about 20% of steam by weight on the coal carbonized, with the production of about 11,600 cu.ft. of coal gas and 8,400 cu.ft. of water gas per ton of coal. The throughput is about seven tons of coal per day in an 82 in. retort.

By using blue gas as a carrier the throughput can be increased to 14 tons per day; the yield of coal gas is still 11,600 cu.ft. per ton and the blue gas injected is 8,400 cu.ft. per ton if the calorific values be unchanged.

The heat which must be transmitted through the retort walls in these two cases is estimated to be as follows:

HEAT REQUIRED FOR CARBONIZATION

(Therms per ton coal)

Calorific Value of gas made = 450 B.Th.U. per cu. ft.

	Steaming (20%)	B.W.G. Injection
Coal throughput per day	7 tons	14 tons
	therms	therms
Sensible and latent heat in gas made ..	4.4	3.9
Endothermicity of water gas reaction ..	4.0	*Nil*
Heat recovered by secondary air	3.2	2.1
Heat lost in coke cooling	4.4	3.1
Total	16.0	9.1

The heat requirement per ton of coal is thus much greater when steaming, and apart from any effect of the carrier gas on the rate of heat transmission it is evident that the throughput could be increased from seven tons per day to about 12.3 tons per day by the injection of 8,400 cu.ft. per ton of blue gas. It may be noted that the heat requirement when steaming at about 5% is 11.7 therms per ton, and the calculated throughput is 9.6 tons per day, in comparison with a throughput of nine tons per day obtained in practice under these conditions. When steaming at 20% the volume of steam admitted (calculated at S.T.P.) is 2,800 cu.ft. per hour, and the combined volume of undecomposed steam and water gas is 3,900 cu.ft. per hour; the steam must penetrate some distance up the retort before the combined volume reaches the latter figure. When injecting blue gas with a throughput of 14 tons of coal per day the gas injection rate is about 4,900 cu.ft. per hour and this rate is applicable from the lowest level of the retort. The effect of this increased volume of carrier gas on the throughput must be considerable, and is presumably responsible for permitting the throughput to be increased to 14 tons instead of 12.3 tons as calculated from the heat requirements.

It might be of further interest, said the authors, to consider the position if, in a retort working with a throughput of 14 tons per day and a gas injection rate of 4,900 cu.ft. per hour, the equivalent volume of steam be substituted for the carrier gas. Assuming the percentage steam decomposition to be normal, the heat requirement of the process would increase to over nine therms per hour as compared with a normal heat requirement of 4.7 therms per hour when steaming at 20%, 4.4 therms per hour when steaming at 5%, and 5.3 therms per hour when injecting blue gas. In practice heat cannot be supplied through the retort walls at such a high rate; the temperature of the charge therefore falls, steam decomposition deteriorates, and the coke leaves the retort incompletely carbonized.]

The authors continued that Mr. Gaskill had underlined the point which the authors had emphasized, that the results of the work showed the effect of full scale application on the overall results to be anticipated from the process, and the practical problems to be solved. The information he had given on the use of inferior coals and blended fines was very useful and seemed to indicate that the problem was indeed one of obtaining adequate heat transfer from the carrier gas at the plastic zone. With fine coal the plastic layer was likely to be continuous, so that penetration of carrier gas into the interior of the charge must be very limited in amount.

Mr. Gaskill's remarks on the economics of the process were complementary to those of Dr. Burns, and indicated the uneconomic consequences of operating the process to make gas at the higher calorific values. With regard to the experiment at reduced temperatures, the authors felt that while the quality of the coke produced had indicated that a higher throughput could have been achieved at the combustion chamber temperatures employed, perhaps the more important point was that with a throughput of nine tons per day it might have been possible to operate at somewhat lower temperatures. It was, however, doubtful if any reduction of temperatures below about 1,200°C. would be permissible if the primary aim was the manufacture of gas rather than a smokeless fuel. In order to avoid degradation of hydrocarbons it seemed probable that the maximum end-temperature in the charge would be about 800°C., and under these conditions the residual volatile therm content of the coke must be high. The yield of gas would be correspondingly low, and major changes in the relative selling prices of coke and gas would be required to make this an economic process.

In the results obtained by the authors any real effect of the carrier gas process on the quality of the coke produced had been masked by variations in the completeness of carbonization. There was, however, evidence that when carbonizing Durham coal by the carrier gas process the bulk density of the coke was very much reduced.

Mr. W. A. Evetts, proposing a vote of thanks, commented on the dreadful things they did with their carbonizing plants. A vertical retort installation was designed with great skill and erected with care, and yet they proceeded to pour in, to quote the authors, 15 different grades of coal varying from peas, singles, doubles and trebles to run-of-mine, with pieces up to 5 in. by 3 in. by 3 in. entering the retort—swelling numbers varying between 3½ and 7—then they were mildly surprised if they got uneven coal travel! No doubt those coals were mixed in different proportions from day to day, from hour to hour—they were all faced with the same conditions—and yet they knew that if they wanted ease of working and consistent results they should start with a reasonably consistent raw material.

It was inevitable that the results tabulated in the paper should be compared with those they had received from Messrs. Nicklin and Redman, and while the results produced were similar, there was a great difference between the fuel consumption. This might, of course, be due to the variety of coals that were used at Bow Common, whereas he believed that Nicklin and Redman used a more consistent mixture of washed doubles. Then again, the breeze produced with blue gas injection would appear to be unaccountably high.

CHANGES I WOULD LIKE TO SEE—From p. 452.

tion. Thus, in the training of younger engineers—for example, in the new North Western Gas Board Sandwich Course—attention is being paid to the study of English, so that students may be enabled to produce information in an accurate, readable and concise form.

Turning again to more technical matters, I should like to see the adoption of a healthier attitude towards standard specifications and codes of practice which, while undoubtedly valuable, can, if unintelligently used, stifle original thought. These publications should be regarded more as guides to good practice than as rules to which one must at all times conform. I feel that much of this emphasis on codes of practice has arisen because of the absence today of the highly skilled supervisor whose training, pride, and interest in the job ensured that the highest standards were maintained. In fact, adequate training of the right type of supervisor would avoid the too rigid use of codes of practice.

Such a line of thought leads one naturally to consideration of other 'standards' of design accepted not because of official origin but because they are hallowed by orthodoxy. I am thinking particularly of gasworks layout, which seems to be dictated largely by outworn conceptions. For example, merely because in the early days of the industry the exhauster house was the one part of the works which could be made pleasant, it seems obligatory to regard the separate exhauster house as an essential principle of gasworks planning. The result is that, in most lay-outs, the exhauster house, condensers, etc., tarrers, washers, etc., are scattered over wide areas. There seems to be no fundamental reason why all this equipment should not occupy the site of the carbonizing plant, just as the auxiliaries in the power station are an integral part of the main station building. The principle is that of planning in height rather than in ground area.

On the question of works development, mention must also be made of the magnitude of capital costs as compared with those of pre-war days. This is, no doubt, a consequence of higher wages and higher living standards and of necessarily improved working conditions. Clearly, while little can be done by the operator or the user materially to reduce the level of capital costs, it does lie within his power to reduce to a minimum the time during which capital lies idle, producing no return. This is a feature which I should like to see considered more seriously in the future; means should be sought whereby capital expended can be more speedily brought to fruiton.

There has been much discussion in recent years of the use of oxygen in industry; indeed, the availability of 'tonnage' oxygen has always been a chemical engineer's dream. Developments in oxygen plant design and the possible availability of cheap power from waste heat have brought this eventuality nearer. I should like to see much greater study of what might prove to be a most fruitful development. A consequence of the use of oxygen in gasification, for example, might mean a reduction in the inert content of town gas, with the many technical and commercial advantages which would result therefrom.

Those who have read Dr. Pexton's classic paper on the fuel consumption of carbonizing plants will remember the stress which he laid on the advantages of recuperation. There is no doubt that the technique could be used with much greater advantage. One of the obstacles to be overcome is the design of recuperators of high performance and reasonable bulk. I feel that there are now available metallic recuperators capable of the duties which Dr. Pexton mentioned and that their use should be given serious consideration.

There is an engineering association—probably more so today than heretofore as the number of engineer-general managers diminishes. Members may therefore feel that the Association will develop on more purely technical lines, but it would be a serious mistake to think that it should not concern itself with management; indeed, it is more than ever necessary to study personnel and management principles.

If we study those features which characterize good management and a good manager we will find that an essential and fundamental quality is integrity. A manager spends most of his time with the people he manages. The men with whom he works know in a few weeks whether or not he has integrity.

We are all concerned with high productivity, the key to which is a facility for developing the right spirit not only in the management team but in the workers of every grade. This implies a steadfast and conscientious application of the principles of conduct and ethics. In good management the question asked is not 'Who is right?' but 'What is right?' To elevate personality above the requirements of the work is corruption and corrupts. If a manager asks "Who is right?' subordinates are encouraged to play safe if not to play politics. A successful team grows—it cannot be selected.

If our industry is to progress we must be ready to change our methods and our mental approach in response to the challenge of the times. While remembering the lessons of the past and giving due credit to the efforts of our predecessors, we must develop and maintain an enquiring and adventurous spirit. Let us forget sectional interests and outworn formulæ and seize the opportunity presented to us by the circumstances of today.

THE FACTORIES of George Kent, Ltd., engineers, at Luton (Beds) and London will be closed for the annual works holiday from July 15 to August 2. The South Wales factory at Resolven will be closed from July 23 to August 7. Offices at the factories will remain open during the holidays.

The Testing Time is Near*

By ALBERT ALLEN, M.Inst.Gas E.

Divisional General Manager, Warwickshire Division, West Midlands Gas Board.

MOST senior posts in the gas industry in the past have been filled by men who were originally recruited direct from appropriate schools. This practice worked very well, particularly as there was quite often a useful follow-on family tradition in the gas industry. Under nationalisation family industrial traditions cannot be expected to continue as previously, and it is now also difficult for a reasonably bright boy whose parents are willing and able to keep him at school to avoid going to a university. If, however, such a boy does not go to a university, it appears that in the Midlands at least he has a preference for the many vacant posts in industries other than our own. What of the boy who goes to a university and obtains a science degree; is he attracted to our industry? In the West Midlands area we have not been fortunate in recruiting graduates from the universities. In these days young men thinking of employment on leaving school are not really interviewed by the employer; rather do they themselves interview the employer. Consequently they are looking, in the main, for a well planned training scheme which will offer them good prospects.

The Industry Offers Prospects

The gas industry offers prospects. It does not, however, in black and white state clearly the lines of promotion nor the plans for training. Certain publications of the Gas Council and of our own Institution are most helpful and go some way towards doing this but by no means far enough. In my part of the country I am facing the competition of the motor and allied industries, which issue attractive booklets giving full details of their excellent training schemes. This is so formidable an opposition that the gas industry at the moment cannot hope to make any impression. To ensure the continued success of the industry something will have to be done to improve the recruitment of potential leaders, senior technicians, engineers and managers.

In the first place it might be helpful if it could be made quite clear that suitable youths entering the industry direct from school who did well at work and in the necessary examinations would have an equal chance of promotion, at all levels, with university graduates in the industry or outsiders who may apply for advertised posts. After all, there is a difference of opinion about the value or scope of university graduates in industry. For example, the famous aircraft manufacturer, Sir Frederick Handley Page, is reported to have said 'I find that men who have come up the hard way become top managers, while the university graduate too often ends up in a technical pigeon-hole.'

Regarding the Institution's regulations for the education and certification of those engaged in the technical work of the gas industry, the major courses are a frequent topic of conversation. The question of whether the Institution's major courses are worth while as compared with university courses is one that you can put to yourselves as individuals; you know the conditions and tendencies in our industry today.

The consideration that the North Western Gas Board has given to this matter of education is commendable. Its Manchester Group Training and Education Officer, Mr. E. W. Stevenson, states in a paper entitled 'Laying the Foundations' that: 'It must surely be the ambition of all production and distribution students to obtain the Associate Membership Examination and eventually become Corporate Members of the Institution of Gas Engineers, but the standard is high and the way long and difficult. The Board is conscious of the arduous academic pathway which faces the student today and to help him to attain his goal more quickly has instituted a three-year College Associateship Sandwich Course in Gas Engineering (Production and Distribution) at the Royal Technical College, Salford.' Is the writing on the wall? Is the Institution's major courses scheme of education out of step with the possibilities and requirements existing today?

The testing time for area gas boards is near; what is done or not done within the next few years is likely to determine for all time the success or failure of our industry. It is, therefore, the duty of all members to devote themselves to the tasks that lie ahead with energy and determination, to face facts without fear, to maintain the high traditions of our modern managerial society, and without detriment to themselves to be loyal to employer or chief who, on his part, should not forget that a man gets the loyalty he deserves, and so does a public board or a Government.

The industry is confronted and somewhat bewildered with the number of uncertainties, complexities, and differences of opinion regarding gas production and supply in the future. Before the publication of the Beaver Report some said no more traditional carbonizing plants should be constructed. Processes for the production of gas direct from a variety of oils, petrol, etc., have been put forward. Plants for the total gasification of coal are being advocated. There is the Lurgi process and the carrier gas or Rochdale process. The search for natural gas continues, and there is a proposal to import 'deep freeze' gas. Large volumes of gas from Wales to several gas board areas in England have been mentioned as possibilities. Always there is the question of coal itself, its price, quality and the tonnage available. Some take the view that gas making or coking coals will never again be available in sufficient quantity to meet requirements. We have to consider mixing and blending of coals. Some people forecast a short life for the gas industry because of the plans for the atomic power age.

Additionally, serious research work is being carried out on behalf of the iron and steel industry to devise a process to reduce iron from its oxide without the use of coke in blast furnaces. Assuming a satisfactory method is found, it means the closing down of coke ovens, which in turn would create a real problem for those area gas boards taking large quantities of gas from coke ovens. A development of this nature could materially alter the economic structure of the major part of industry in towns like Sheffield and Stoke-on-Trent.

Three Promulgations

Out of this maze of problems, ideas, proposals and suppositions three important promulgations have recently appeared: First, that of Mr. Geoffrey Lloyd, the Minister of Fuel and Power, who in announcing the Government's nuclear power programme, said 'Coalmining will continue to be the backbone of this country for our lifetime and our children's lifetime'; second, that of Sir Harold Smith, Chairman of the Gas Council, who in respect of the report of Sir Hugh Beaver's Committee on Air Pollution said: 'I am delighted to find that the recommendations contained in the Beaver Committee's report on air pollution vindicate the views frequently expressed by the gas industry over many years. The gas industry can be relied on to support the implementation of these recommendations'; and third, the address of Mr. H. F. H. Jones, Deputy Chairman of the Gas Council, and Junior Vice-President of our Institution, to the Scottish Junior Gas Association (Western District) on March 5, entitled 'Future Methods of Gas Production.'

Some of the processes we have heard so much about during the past few years are not satisfactory in all essential respects. If serious harm to the industry is to be prevented procrastination must be stopped respecting the construction of base load plant for the future. We must know the truth about other than traditional plant or processes, without any misleading propaganda, so that further research and investigation work can if necessary be diverted into new or more promising channels. In short, the wheat must be separated from the chaff without delay. Sales of appliances have improved tremendously, but it is just another case of circumstances quite outside the real work of sales managers. These sales are mainly due to the

*From the Chairman's Address to the Annual Meeting of the Midland Section of the Institution of Gas Engineers in Birmingham, April 22, 1955.

increased prosperity of the nation and the higher spending power of its people, coupled with the lifting of certain Government restrictions and the excellent advertising and publicity work of the Gas Council and others. It will be said that the work of advertising and publicity is carried out by or under the direction of sales managers. It is, or it may be, but its weakness lies in the fact that it is impersonal, and generally speaking it must be backed up by the personal work of salesmen if it is to justify its high cost.

Others will say we have sales conferences, and they are not impersonal. Conferences are fashionable in these days, but they are impersonal in the selling sense when they do nothing more than continually deal with the same persons; it is the market that should be given more attention by our top-level sales managers. The possibilities of the market and our capacity to supply are the essential matters. What do sales managers tell us about market possibilities? Practically nothing so far as I am aware. Their sales targets appear to be based on our own actual selling, not on potential selling. In my opinion top-level sales executives should tell us what amount of additional gas they can sell year by year through the use of new appliances and any other means. If they give us too high a figure for the capacity of plant at a given time, then we should tell them how much to sell until we have increased plant capacity.

What we want most urgently in the gas industry is properly planned or scientific methods for the selling of gas and coke. Gas and coke appliance manufacturers should also be told well in advance what we shall require from them so that they can work to a definite plan of production. Proper attention to these matters would tend to reduce costs.

Top Salaries

In looking for the reasons why our industry is failing disastrously to attract the right type of new entrants who should ultimately become chief technical and managerial executives, we cannot ignore the salaries of members of the Gas Council and full-time members of area gas boards, which are, of course, made public. Most men quite naturally try to get some idea of top salaries in order to enable them to assess the possibilities of lower grades. In the case of our industry what do such enquiries reveal?

It has been reported that in 1948 the then Chancellor of the Exchequer pointed out that the salaries of the Chairmen and Members of Public Boards were fixed 'at the level necessary to obtain men with the qualifications and experience required for these highly responsible posts, having regard to the current salaries obtainable for similar posts in the field of private enterprise.' At the time this statement appeared to be broadly reasonable, but although wages and salaries generally have been raised considerably since May 1, 1949, there has not, so far as I am aware, been the slightest increase in the remuneration of members of the Gas Council and full time members of area gas boards.

To put it mildly this is unreasonable and unjust, especially when you take income tax into account. The financial reward for the position of an area gas board chairman at £4,500 per annum is known to be no better than that for the post of executive director of many privately-owned companies with a paid-up capital of less than £1 mill. and employing a few hundred workers only. Now let me give you some information about two privately-owned enterprises to show how far behind our industry has fallen in this matter of top salaries. In a company with factories in my division with an authorized capital of about £10 mill., the total emoluments paid to eight executive directors in 1954 amounted to £103,360, an average of £12.920 each; nearly as much as the sum of the salaries of three area gas board chairmen.

This may be surprising, so let us get a little closer to nationalisation, or away from it. Recently one of the smaller de-nationalised iron and steel concerns made it publicly known that the estimated emoluments of eight directors for the financial year ending October 1, 1955, was £63,900, an average of £7,987 each.

The Competition for Labour

At the present time many of us have to deal with a troublesome shortage of skilled and unskilled labour, and one of the bad features of this is that the great majority of new entrants are of poor quality and uninterested in their work. This, of course, leads to increased working costs. With more jobs than men available it surely follows that there is keen competition for labour. It is, therefore, interesting to compare our chances of recruiting satisfactory labour as against private enterprise.

With leading industrial companies in this country and abroad there is a growing movement to introduce profit-sharing or near related schemes, whereas in the gas industry such schemes as were previously in operation ended with nationalisation. Recently I.C.I. and Courtaulds, Ltd., have announced their intention to introduce profit-sharing schemes. Some companies have made it easy for employees to become shareholders, even to the extent of allowing them to take up shares on deferred payment terms. Several privately-owned companies have gone so far as to guarantee long-term regular employment to their workers. In the United States it is claimed that profit-sharing in a broad sense—if taken to include firms paying regular cash bonuses based on profits—was practised by over 12,000 firms in 1953 as compared with fewer than 750 in 1946. Then there are incentive bonus schemes, which have been widely applied in private enterprise for many years but are not yet in sufficient use in our industry.

Research and Development Work

Our industry requires an intensification of industrial research and investigation work rather than what may be termed fundamental scientific research, the kind of work that has been so aptly described as 'finding out what you are going to do when you can't keep on doing what you are doing now.' For several years emphasis has been placed on curtailing the use of coking coal and preferentially manufacturing gases which will entail the use of petroleum products and non-coking coals. It now appears certain that the gas industry as a whole will have to focus attention on producing solid smokeless fuel and coal gas. This means the continued use of carbonizing plant.

Modern vertical retort installations are quite flexible and it does not need a very vivid imagination to realize that their flexibility could be increased by the use of alternative fuels for heating. We could switch from one to another as circumstances changed. The economics of using oil, town gas, and gas produced from non-coking coals for heating retorts should, therefore, be fully investigated. All the respective factors would have to be taken into account, including operational labour charges and life of plant.

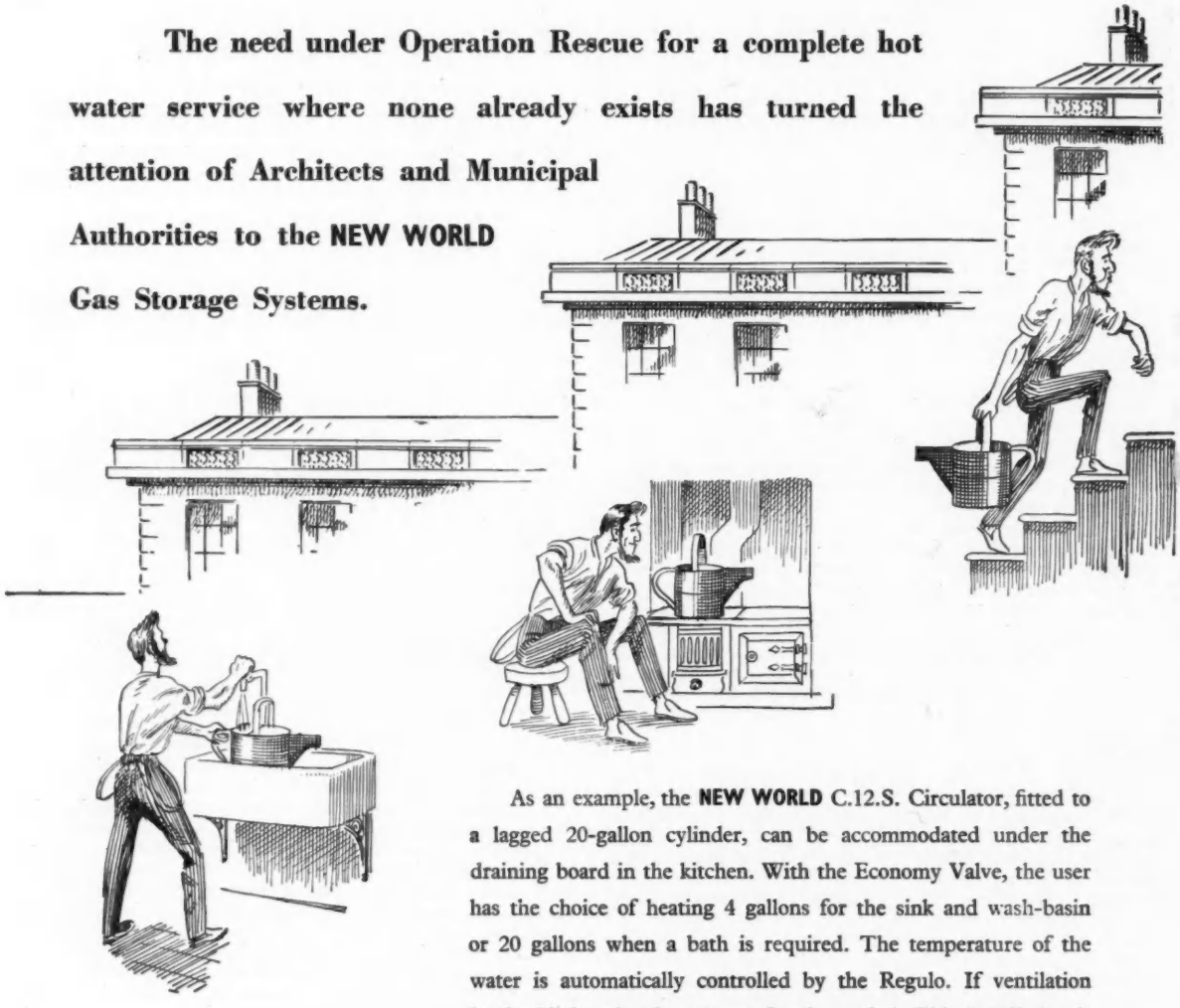
Approximately 3,700,000 tons of coke per year are used by the gas industry for heating retorts. A small portion of this amount would not be suitable for use in domestic grates, but, allowing for this, if an alternative fuel were used for heating retorts coke would ultimately be released sufficient to replace 10 mill. tons of smoky coal per year. This would meet the requirements mentioned in the Beaver Report, provided that the smoky coal displaced was, if suitable, made available to the gas industry or other arrangements made for the interchange of coals to meet our requirements.

Matters Worthy of Attention

1. Incentives for employees comparable with those in operation in the leading private companies.
2. Schemes, pronouncements, and advertisements to help in the recruitment of the right type of all grades of personnel.
3. Raising of productivity—*i.e.*, more efficient use of our manpower, machine-power, fuels, materials generally, transport, etc., so that with the same constituents there is an increase of saleable products with a saving in costs of production.
4. A review of all existing research and investigation work in the light of the real circumstances and requirements now existing, with an appreciation, in so far as it can be made, of the various factors that are most likely to affect our industry during the next five or 10 years.
5. The dropping of useless standardisation and the taking of more definite steps to prevent frustration and waste of effort at all levels.
6. A better understanding of and respect for human relationships in industry, with a better application of team work.
7. Further precautions to try to avoid accidents of all kinds within our own undertakings, and additional measures to prevent accidental gassing incidents outside.
8. An improved service to all our customers.
9. Improved quality and marketing of coke.
10. To aim for economic as against pure technical efficiency.
11. The reduction of sulphur compounds in town gas.
12. The prevention or elimination of restrictive practices.

NEW WORLD TO THE RESCUE

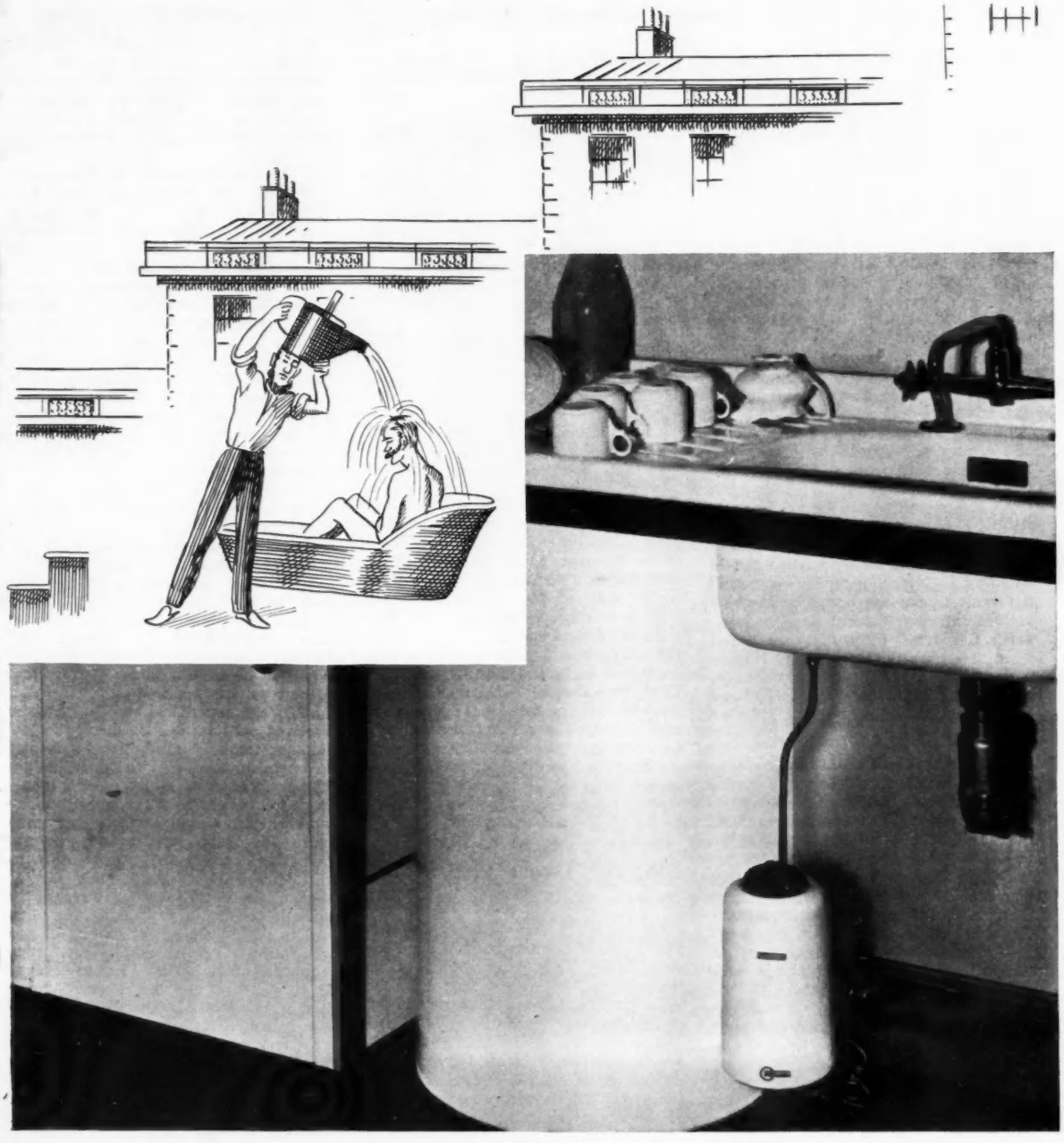
The need under Operation Rescue for a complete hot water service where none already exists has turned the attention of Architects and Municipal Authorities to the NEW WORLD Gas Storage Systems.



As an example, the **NEW WORLD** C.12.S. Circulator, fitted to a lagged 20-gallon cylinder, can be accommodated under the draining board in the kitchen. With the Economy Valve, the user has the choice of heating 4 gallons for the sink and wash-basin or 20 gallons when a bath is required. The temperature of the water is automatically controlled by the Regulo. If ventilation in the kitchen is adequate no flue is needed. This installation is being extensively used in new houses and flats, and for the modernising and conversion of old property.

A similar type of installation is available for use in an airing cupboard; and when the house contains no ball valve cistern, a combination unit complete with cistern mounted on the cylinder can be supplied.

Further information from **RADIATION GROUP SALES LTD., 7 STRATFORD PLACE, LONDON, W.1.** *Phone: MAYfair 6462*



NEW WORLD Storage Water Heaters are reasonably priced, easily fitted, economical to use, provide hot water at the same temperature, Summer and Winter, can normally be operated on the existing Gas and Water Services and require an absolute minimum of maintenance.

recommend NEW WORLD PRODUCT OF Radiation Ltd *storage water heaters*

Eastern Juniors Annual General Meeting

Mr. R. W. Hilham, who relinquished the task of Hon. Secretary and Treasurer of the Eastern Junior Gas Association a year ago was presented with a cheque and an illuminated address at the Association's annual general meeting on May 7. The meeting at the George Hotel, Luton, was followed by a luncheon to which ladies were invited, and the whole party spent the afternoon at Luton Hoo, viewing the Wernher collection.

Mr. Hilham, who is Distribution and Sales Manager, Colchester Group, had been Hon. Secretary since the foundation of the Association in 1946. He was Secretary of the *ad hoc* committee who planned matters in 1947. Thanking the Association for the presentation, Mr. Hilham said he had angled for the job of secretary—deliberately—in order to achieve a promise he had made to his chief years ago. In 1933, said Mr. Hilham, he had gone to Colchester to work under Mr. Townsend, who was interested in forming a junior gas association. 'His stumbling block appeared to be a secretary and he entrusted me to accept the post if the association should be formed. Unfortunately his plans did not come to fruition and I believe that at that time the Eastern Section Salesmen's Circle was formed instead'. But when the time did come, Mr. Hilham went on, he took the job in honour of his old chief. 'Whatever I did, I did for you and for him'.

New Officers

Officers for the 1955-56 session are: *President*, F. G. Cox (Norwich), *Senior Vice-President*, E. S. Dennis (Colchester), *Junior Vice-President*, J. L. Ireland (Lincoln). H. E. Wilks (Watford), who took over from Mr. Hilham last year, was re-appointed *Hon Secretary and Treasurer* and D. F. Rudge (Lincoln) continues as his assistant. *Council*: W. J. Spiller (Cambridge), G. Hall (Chelmsford), W. J. Pritchard (Tottenham), and A. B. Scott (Cromer). R. W. Hilham (Colchester), D. G. Simpson (Watford) and E. H. Winch (Cambridge), were re-elected to serve on the Eastern District (I.G.E.) Gas Education Committee.

Mr. Cox, the newly elected President, proposed a vote of thanks to the retiring President, Mr. R. F. Robinson (Watford), and the Secretary proposed a vote of thanks to the Eastern and East Midlands Gas Boards. Mr. Bernard Clarke, M.B.E., General Manager, Lincolnshire Division, responded.

The Society of British Gas Industries' Silver Medal Award was made to Mr. P. Caston Forbes (Scunthorpe) for his 'The Use of Nitrogen in Purging Practice'. Mr. Bernard Clarke said one of the reasons why he had come to the meeting was personally to be associated with Mr. Forbes in having this distinction.

Good wishes were expressed to Mr. R. O. Emmony (Cambridge), who was leaving the area to take up a position with the Scottish Gas Board.

At lunch, after members had joined the ladies, Mr. W. A. Evetts, Divisional Engineer, Watford Division, Eastern Gas Board, proposed the toast of the Eastern Junior Gas Association. The Association was, Mr. Evetts was sure, filling a great need in the Eastern Districts. They were the people who would eventually occupy the senior positions in industry. Mr. Evetts, who had exhibited with pride a cup-final ticket, had difficulty in assuring his listeners that it was not this that made him keep his speech within reasonable length, but the fact that he wanted to ensure that they spent a good afternoon at Luton Hoo.

Mr. F. G. Cox responded.

The toast of the Eastern Gas Board was proposed by the President, and Mr. T. C. Battersby, General Manager, Watford Division, replied.

The Sun—As Usual

The 'JOURNAL' never grows tired of repeating the Eastern Junior 'good weather' legend. This year, as usual, the sun shone brilliantly as the Juniors drove through immaculate Luton Hoo Park to the historic Bedfordshire house of the Wernher family. If gas engineers have no time for artistic pursuits, they are at least suitably impressed by competence in other worlds than their own.

Some admired the Dutch 17th century paintings; others spent too much time enthralled by fantastically intricate early European ivories. Nearly all daydreamed in the fabulous dining room and, not until the party concluded in the restaurant (once the kitchen) was the subject 'gas' touched on for conversation.

Watson House Centre and Its Work

Mr. L. W. Andrew, Director, Watson House, at the April meeting of the Yorkshire Junior Gas Association, outlined the work of the Watson House laboratories for the London Research Station and the Watson House Centre. He made special mention of the arrangements by which the Watson House Centre gave a service to all the gas boards and made full use of the knowledge and experience of the laboratories and technical experts of all boards. Reference was also made to the liaison with the Society of British Gas Industries, other research organizations and the British Standards Institution.

The President, Mr. Henderson, warmly thanked Mr. Andrew for his most interesting and instructive talk, and Mr. Carter, formerly moved a hearty vote of thanks for an entertaining afternoon.

Mr. Banks, Senior Vice-President of the Juniors, thanked the authorities of the Leeds University and particularly Professor A. R. Roberts of the Department of Coal-gas and Fuel Industries.

There was also a vote of thanks to Mr. N. G. Appleyard and Mr. A. J. Winter; and to Miss J Hopwood and other home service advisors of the Leeds Group for their hospitality.

Cookers in the Making

It is a well-known cliché that the average person takes for granted some manufactured item which has cost many others months of hard work and patient research, and this is certainly true of the Warwick cooker which we recently saw in the course of manufacture at De La Rue's Portobello Works in Warwick.

It was only nine years ago that Thomas De La Rue & Co., Ltd., formed a gas division and acquired the Emscote foundry in Warwick. In that short time the Company have made great strides in the design and development of their gas cookers. In 1949 they produced the first 1½ size cooker—the G.5—which incorporated a large oven with hot plate cooking at the correct level, and five burners on the hot plate, which was able to suit two markets—the domestic market and also the light catering industry. In 1954 the 'Warwick' cooker was introduced which was in effect a purely domestic cooker, incorporating all the advantages of the 'G.5' but introducing a number of new features to simplify the work of the housewife and make her work more pleasant. There were the hot-plate simplified for ease of cleaning, the oven raised to cut out unnecessary stooping, the grill brought to eye level, a warming drawer added, and a 4-hour timer built into the hot-plate. And last but not least the 'Warwick' was produced in as wide a range of attractive colours as was possible.

All this sounds as though it was achieved very easily, but there were all sorts of technical difficulties which had to be overcome. At the start, in the foundry, the castings presented a challenge to even the most skilled of foundry workers, on account of their size, complexity of shape, thin section, and the fact that subsequently they have to be enamelled. Because this highly skilled labour is becoming increasingly difficult to obtain, mechanization has had to be introduced for casting of the less intricate components. Apart from labour, the material used has to be kept up to standard, and the process laboratory is continuously checking to make sure that conditions of pouring temperatures and analyses of metals are always in control. Then again, the enamelled components have to receive detailed inspections to ensure they will resist acid and thermal shocks. Especially must the safety of the appliance be ensured, and every bought-in component, such as taps and thermostats, as individually tested and inspected before going on to the assembly track. When finally the cooker is completely assembled, it is tested to see that every component carries out its function; also random samples are taken which pass through a detailed inspection, including cooking tests.

Ten aged miners' homes erected at Greenside (Co. Durham) were officially opened by Mr. C. R. Attlee. The houses are known as the William Whiteley Homes, after the former Member of Parliament.

What of the Future?

Mr. D. P. Welman Addresses B.G.S.A. Conference

Addressing the annual conference of the British Gas Staff Association at Blackpool on May 6, Mr. D. P. Welman, Chairman of the North Western Gas Board, said he thought, looking at the industry's future, most people would turn their attention first to the possibilities arising from the development of nuclear fission in the generation of electricity. It had been said that they in the gas industry were afraid of electricity but he did not in the least feel afraid of it. They merely found it to be a keen competitor and it gave them satisfaction to see that it did not win. But when they came to think of nuclear fission and the possibility of doing away with coal-fired boilers in power stations it might look a little alarming. But he did not believe that nuclear fission applied to electricity production could affect them materially for more years ahead than need unduly concern them now.

The most important recent development affecting the gas industry was the report of the Beaver Committee on Air Pollution, which would affect them more in the next 10 or 20 years than nuclear energy, methane obtained from the Middle East, or any other thing. The Report had already met with full public support, and we had the unusual sight of both sides of the House of Commons vieing with each other in bringing strong pressure to bear to put the recommendations of the Report into practice. The Beaver Report if brought into legislation in its present form would provide two things. It would provide first, that local authorities should have the power to create completely smokeless zones. Secondly they would have the power to create smoke controlled zones in domestic districts where the limitation was to the extent of insisting that no one should burn or emit from chimneys smoke from a fuel which contained more than 20% of volatile matter. If the Beaver Committee had insisted that the first of these two, the absolute forbidding of smoke, be pressed, then he thought they would have failed; they had been wise, having pressed that first they should come to the second point, the smoke-controlled domestic zone, forbidding the use of fuel with more than 20% volatile matter.

The gas industry would be asked to step up carbonization of coal by 10 mill. tons per annum for the next 10 years. But where would they get a further 10 mill. tons of coal? He was not worried about that because if this country, through its Government and people, intended to do something it would do it and for once they would not be the people who were expected to stock the coal for others' benefit when they were short; they would put the first priority on coal. Already, before any legislation, they were getting a considerable increase in their allocation and there was promise of further considerable increases next winter.

The Chairman (Mr. W. E. Webb) addresses the Blackpool conference. With him on the platform (left to right) are Mr. T. R. Robson (Financial Officer), Mr. C. C. Holt (Vice-Chairman), Mr. F. C. Henfrey-Smith (General Secretary), and Mr. H. J. Arnold (National Organizer).

If they were to carbonize the extra 10 mill. tons of coal for the next 10 years then they would be providing, not as at present 11 mill. tons of coke for sale, but an increase on that of 5 mill. tons, an increase of 45%. At the moment the industry was producing 2,500 mill. therms a year. With the extra carbonization they would have an additional 800 mill. therms of gas for disposal. Each 19 mill. tons of bituminous coal was normally used in the domestic areas which were intended to become smoke-controlled and of that 19 mill. tons, 10 mill. was to be the gas industry's share. The other 9 mill. tons would be replaced by other forms of smokeless fuel, such as anthracite, electricity, and oil.

They were expected from the carbonization of these additional 10 mill. tons a year to produce some 32% more gas. They had 10 years to reach this target so they could reach it by increasing gas output for sale by 3% per annum. Was there any doubt that they could sell 3% additional gas each year?

Mr. Welman concluded by reiterating his belief that they had a wonderful opportunity in the gas industry. They had never had a better, but if they were going to take it, each one must take it. The only success this industry could ever hope to achieve would come from the individual efforts of the people in the whole of the industry. The North Western Gas Board had a happy record for the last five years, entirely due to the fact that in some extraordinary way everyone in the area had come to pull in the same direction for the same reasons. If they got 20,000 men determined on one objective they had such weight behind it that no-one could stop it.

WORK OF THE CONFERENCE

The conference was attended by over 300 delegates from all parts of Britain. After a civic welcome by the Mayor of Blackpool, Mr. W. E. Webb, J.P., Chairman, gave his opening address which we summarised in the 'JOURNAL' of May 11. The programme included a civic reception at which the Mayor and Corporation entertained 400 delegates and guests. Those present included Mr. J. H. Abell, Industrial Relations Officer of the Board, Mr. J. G. O. Drake, Group General Manager, Mr. J. F. Smith, Production Engineer, Mr. W. H. Billington, Group Distribution Engineer, Mr. J. E. Funk, Sales and Service Officer and their ladies. Mr. Drake expressed his pleasure that the conference had come to Blackpool and congratulated the Association on its work. He said that in these days of large scale organization, it was necessary from all points of view that the staff of the industry should be banded together in such associations.

MR. F. C. HENFREY-SMITH, General Secretary, introducing the annual report, said that two general increases in the salary scales had been implemented during 1954. The Association had no intention of following behind the manual workers in setting standards but considered it important that reasonable differentials were maintained. Later, the staff side of the National Joint Council would ask the Gas Council to consider a general review of the scales as a number of amendments appeared desirable. The Association welcomed the recent acceptance by the Gas Council of the principle of equal pay for work of equal value regardless of sex. It was regretted that, after lengthy and complicated nego-

tiations, it had not yet been possible to persuade the Gas Council of the need for a fair and reasonable overtime agreement which would apply to all staff.

On the question of redundancy, Mr. Henfrey-Smith said that, despite the closing of many gasworks and the centralization of systems there had, in fact, been little redundancy, the B.G.S.A. always being consulted where its members were concerned, and alternative employment being found, although often at considerable inconvenience to the staff concerned.

National Salary Structure

MR. H. J. ARNOLD, National Organizer, said that alhough a national salary structure had been in operation since 1950, it still was not operated uniformly by the boards and he found that the rate for the job varied according to the measure of prosperity of each board. Mr. Arnold suggested that the staff representatives on joint consultative committees were learning the basic principles of joint consultation more quickly than many of the management, but considerable progress was being made in this matter. The B.G.S.A. had made good progress during the year and had maintained better relations with the other trade unions. He believed, however, that at some time in the future gas staffs would accept the view that their best interests would be served in one organization which dealt solely with the affairs of the staff of the one industry.

MR. T. R. ROBSON, Financial Officer, presented the financial statement which showed that the Association is in a sound financial position, although rising costs might necessitate a review of the rate of subscription in the near future.

The conference welcomed the findings of the Beaver Committee on Air Pollution and members were urged to ensure that at election meetings Parliamentary candidates were asked to give full support to the rapid implementation of those findings. The conference, however, did not support the view that the present price of coke should be reduced to encourage the use of smokeless fuel. The delegates instructed the National Council to urge the Government to reconsider the present policy of placing the entire burden of compensation payments on the individual nationalised industries, and also instructed that all possible steps should continue to be taken to secure employee representation on gas boards. The Bournemouth delegation secured support for their view that some form of co-partnership, without shareholding, is essential to sound industrial relationship.

Differentials

The conference viewed with concern the diminishing standard of living of the nation's clerical, professional and administrative workers and would inform the Government of that concern.

The National Council was instructed to seek, together with other professional and industrial associations of such workers, to re-establish the differentials which existed previously. The delegates affirmed their belief that through full and frank consultation between the management and employees of the gas industry, greater efficiency would result. It called upon the managements and all B.G.S.A. members to support the joint consultative committees. Considerable time was spent in rule amendments one of which, a recommendation of the Tottenham Branch that the subscriptions be increased from January 1 next, was not accepted but the National Council was asked to keep the matter under review. Conference decided that in future it would style its two leading lay officers, President and Deputy President, instead of Chairman and Vice-Chairman. It also considered that its annual conference had such great value that it would not reduce its size as had been suggested.

The Tottenham Branch delegates, supported by others, put a case for an application for affiliation to the T.U.C., but this was defeated by a large majority as was a demand that a referendum of all the members be held. The conference demanded that an intensive recruiting campaign be initiated but did not agree to the appointment of additional organizers. It considered, however, that lay representatives, required to settle local grievances and enter into discussions with local management, should be allowed reasonable facilities for such duties.

Conditions of service of the staff and intermediate grades were thoroughly debated. The conference deplored that no new overtime agreement had yet been negotiated, despite instructions at two previous conferences, and it instructed the National Council to take further immediate action in this matter and it also demanded that a basic 38 hour week should apply to all staff. An emergency resolution condemning the National Council for accepting the recent salary award was defeated after an explanation by the General Secretary.

The Conference unanimously and with acclamation re-elected Mr. W. E. Webb and Mr. C. C. Holt as Chairman and Vice-Chairman respectively.

W.G.F. Conference

Six hundred delegates from all over the country met for the third residential Conference of the Women's Gas Federation at Eastbourne on May 3-6. Opening with a Civic Welcome by the Mayor of Eastbourne, followed by the presidential address by Miss K. M. Halpin, C.B.E., the conference got under way with the presentation of several lively and informative papers. These included an account of the use made by gas boards of the technique of Market Research, by Mr. Stirling Everard, M.B.E., Manager of the Market Survey Section of the North Thames Gas Board. At an 'Any Questions' session presided over by Mr. Freddy Grisewood, the panel dealt with a variety of questions, many of particular interest to the housewife. A pointer to the keen interest of the Federation in the policy of the gas industry today lay in the number of pertinent questions asked on the subject of coke, all of which received an informative and well-considered reply from Mr. R. S. Johnson, M.B.E., Deputy Chairman of the South Eastern Gas Board.

Highlight of the four-days' conference was the paper on 'Clean Air' presented by Sir Hugh Beaver, whose clear and forceful views on this vital subject were framed in a manner which was of real value to his largely female audience. Sir Ernest Smith, President of the National Smoke Abatement Society, congratulated Sir Hugh on his illuminating talk, and said that the gas industry should be very mindful of the support which an organization such as the Women's Gas Federation could give it in its development of the important new clean air policy.

On view to the public throughout the conference was 'Mr. Therm's Model Flat, 1955,' designed by the South Eastern Gas Board. Contemporary in style and planning, the flat showed how the latest gas equipment fits harmoniously into a modern setting.

Fry 25 Club.—The third annual general meeting of the Fry 25 Club, associated with Fry's Metal Foundries, Ltd., was held at the Trocadero Restaurant on April 29. Six members qualified during the year, and the total membership of the Club is now 53.

During Their Visit to the B.I.F. at Olympia, the Queen and the Duke of Edinburgh were shown over the B.B.C. Television Inventors' Club stand by the club's organizer, Mr. Leslie Hardern. The Queen was specially interested in a new guard attached to the hotplate of a gas cooker to prevent pans being accidentally pulled off; 'Very sensible', she commented.

Congratulations and Thanks to the staff of the Southern Gas Board at Salisbury for the support they accorded him throughout the year were given by Mr. J. T. Haynes, Divisional Manager of the Western Division, Southern Gas Board, at the annual dinner of the Salisbury district. Previously, Mr. Haynes had been presented with a pipe by Mr. T. Edelston, Works Superintendent, who welcomed the guests. After the dinner a social was held and numerous prizes were given.

Donald Macpherson & Co., Ltd., announce that in order to extend their service to the growing number of decorators, builders, architects and large industrial concerns in the Yorkshire area, they have recently opened a well-stocked depôt at 22, Saxton Lane, Leeds 9 (T/N. 238563) with delivery service included. Comprehensive stocks will be held of all products, and a full technical service will be available through Mr. E. L. Simpson, who has represented the Company for many years in Yorkshire, and Mr. J. T. Stones, who has recently joined the Company. Mr. H. Boyce is in charge of the depôt.

B.I.F. Industrial Gas Luncheon

Members of the gas industry to the number of more than 200 assembled at the Chesford Grange Hotel, Kenilworth, on May 10, for the B.I.F. Industrial Gas luncheon. The chair was taken by Mr. Henry F. H. Jones, M.B.E., M.A., Deputy Chairman of the Gas Council.

Mr. Jones explained that the gathering was being held primarily in order to emphasise the activities of the industry as represented by their stands at the British Industries Fair at Castle Bromwich. These dealt particularly with the industrial gas side which, according to some who worked in the industry, was sometimes considered a light hidden under a bushel. Stressing the extreme importance of the industrial use of gas, he pointed out that they sold 2,500 mill. therms of gas to 12½ mill. customers, and of that quantity 659 mill. were sold to 105,000 customers. That meant that they sold 26% to 1% of their customers, and that he thought was a remarkable achievement. Further, 20% of the income they got from gas came from 1% of their customers, so they must all appreciate that the industrial gas side of their work meant a great deal to the industry. It must be evident that they rendered a most important service to the industry of the country as a whole. They did not export gas, although they sometimes talked about importing it. Perhaps they would do that some day, but at any rate they did not export it. On the other hand, they believed the gas they sold to industry greatly helped the productivity of the country, further gas used in the factory helped to keep down costs and to improve the quality of work, and as many of the products of the factory are exported that was a most important consideration. In that way they were rendering an important service to industry and they also felt they were promoting the interests and the welfare of the country generally.

Referring to the chief guest, Mr. A. F. Kelly, B.SC., A.M.I.MECH.E., Director and General Manager (Manufacturing), Aero Division, Rolls-Royce Co., Ltd., the Chairman spoke of the association of Mr. Kelly's company with perfection, and recalled that during a visit many years ago he was struck by many things but particularly by a notice, 'If you use a split pin twice it may cost a man's life.'

At this point Mr. Kelly gave his address, which consisted, in the main, of a synopsis of the history of the Rolls-Royce Company's activities in the aero engine field. In the course of his address Mr. Kelly said: 'During all these activities we have had constant support and supply from the gas industry. You might be interested to know that as far as Rolls-Royce is concerned we consume very nearly 600 mill. cu.ft. of gas per annum under present conditions. This is between all our varied factories, and the bulk of the consumption is in heat treatment furnaces and processes with foundry melting applications running second. The foundry application, however, is the biggest single load as this is all concentrated on one site, and that is at Derby.

'All this gas is obtained from the local gas boards at our factories at Derby, Glasgow, Crewe, Barnoldswick and Mountsorrel. In this connection it is interesting to note that during the last war at our Glasgow factory we installed producer gas plant capable of an output of 600,000 cu.ft. per hour with a calorific value of 150 B.Th.U. per cu.ft. We had little difficulty in converting the whole of the town gas burning equipment to use this producer gas, the only exceptions being such items as Bunsen burners and small blow pipes. This move was made necessary by the tremendous demands on town gas in the Glasgow district during the war. I think we may say that in our own factories we are using gas appliances of practically every type from simple Bunsen burners to large furnace installations, gas-fired immersion heaters and, of course, not forgetting the canteen side of the job where gas-fired appliances are used in considerable quantity.

'One interesting application is a piece of plant which we have recently installed. This is a gas-fired flash boiler. The boiler itself is of American design, and I believe that at the moment there is no British equivalent. This application is in connection with the generation of steam in a particular location for driving a small high speed turbine. It is of considerable interest for small steam raising plants where steam is only required at infrequent intervals. Literally within minutes of starting the boiler, steam at the appropriate pressure is available, and conversely the boiler can be shut off in a remarkable short space of time.'

Mr. Sydney Smith, Chairman of the East Midlands Gas Board, who proposed a cordial vote of thanks to Mr. Kelly, said: 'Any mention of Rolls-Royce symbolises perfection, and not just striving after it but in fact achieving it.' He thought it was a wonderful tribute to the wonderful qualities of the late Sir Henry Royce that the standards he laid down for men and materials were maintained as high now as during his lifetime. It was a matter of satisfaction that the gas industry by its service of gas to the Company was able to contribute to so great an enterprise and elsewhere by its service to more than 7,000 industrial processes was able to aid the expansion and success of industry as a whole.

The company then proceeded to Castle Bromwich for a tour of the Engineering and Hardware Section of the Fair.

Gas Made Available for public supply by the North Western Gas Board during April (five weeks ended May 1) amounted to 8,425 mill. cu.ft., and was up by 4% over the amount supplied in April, 1954. April is the first month in the Board's seventh financial year, and the increase in gas supply recorded during this month appears to reflect a continued upward trend, following on the rise of 4½% in gas supply during 1954-55.

NORTH WALES GAS GRID

Our photograph was taken on the occasion of the official and Press visit to the North Wales gas grid described in the 'JOURNAL' of May 11. Left to right are Sir Stanley Rawson (Chairman of Costain-John Brown, Ltd., the contractors), Sir William Jones (Member of the Wales Gas Board), Mr. T. Mervyn Jones (Chairman), and Sir Harold Smith (Chairman of the Gas Council).

The stars of today..

. . . . are constantly in the Public eye. Charming Margo Lorenz is now featuring in the currently released film "Out of the Clouds" — the 'Century' cooker features in thousands of modern kitchens throughout the British Isles.

The pre-eminence of both these stars, in their widely differing fields, is sustained by their superlative and individual qualities —qualities which particularly equip them for their respective roles in contemporary life.

CENTURY features include...

★ Vitreous enamelled surfaces throughout ★ Cream exterior ★ Removable double platerack ★ Used oven heat vented in front of backplate to heat platerack ★ Four fast-boiling hotplate burners with taps having fixed stop for simmering ★ Large quick-heating grill ★ Safety-type taps ★ Hotplate parts removable ★ Roomy oven—base suitable for slow cooking ★ Mainstat oven-heat control ★ Drop-type oven door ★ Oven lights from front by flash tube ★ Storage space in plinth ★ Hotplate side extensions and gas lighter supplied if required

24-year-old Vienna-born Margo Lorenz who plays Leah, a Central European who meets and falls in love with a young American engineer while they await their respective aircraft at London Airport, in "OUT OF THE CLOUDS", an Ealing Studios Production directed by Basil Dearden.

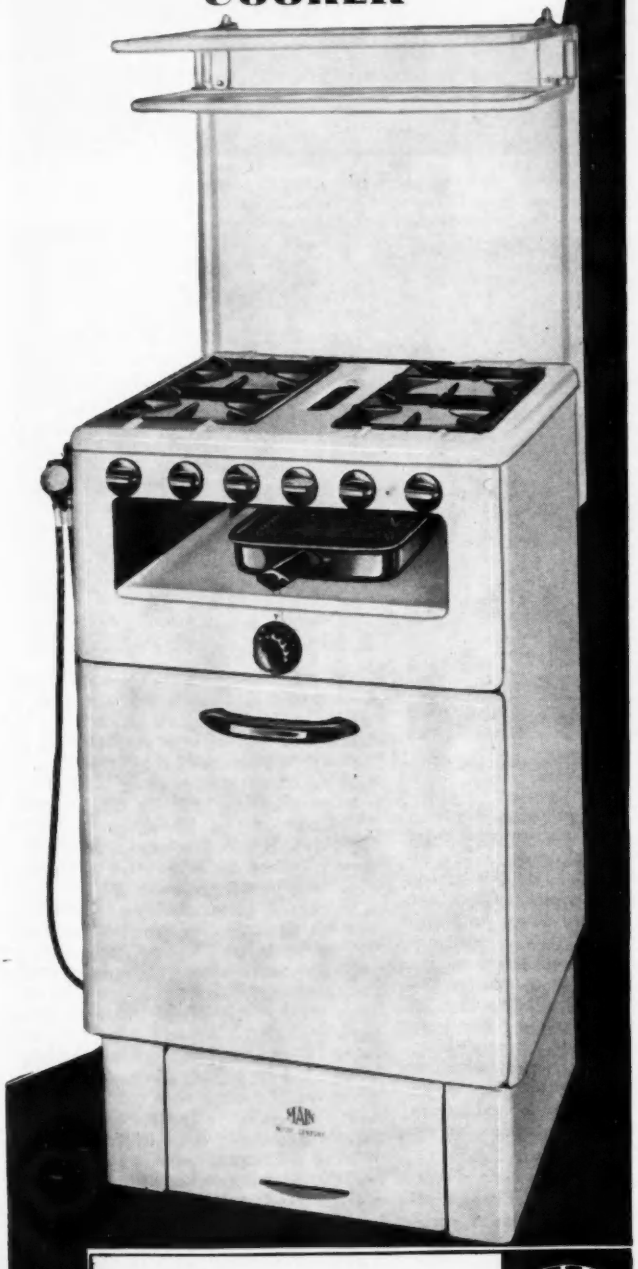
R. & A. MAIN LIMITED
LONDON & FALKIRK

C38

THE MAIN No. 20

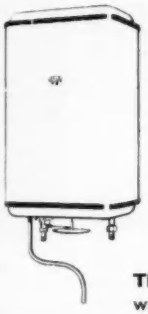
CENTURY

COOKER



Note the name-made by MAIN

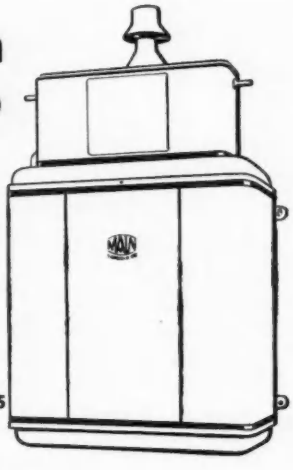
constant hot water . . .



for the sink or wash basin . . .

The Thermain No. 2 with 2 gallons capacity. Finished in cream or white enamel and with black decoration.

or from any tap in the house..



The Thermain No. 15 Multipoint with 15 gallons capacity. Finished in white or cream enamel paint.

from MAIN storage water heaters

. . . There's one for every domestic purpose

MAIN WATER HEATERS LTD.

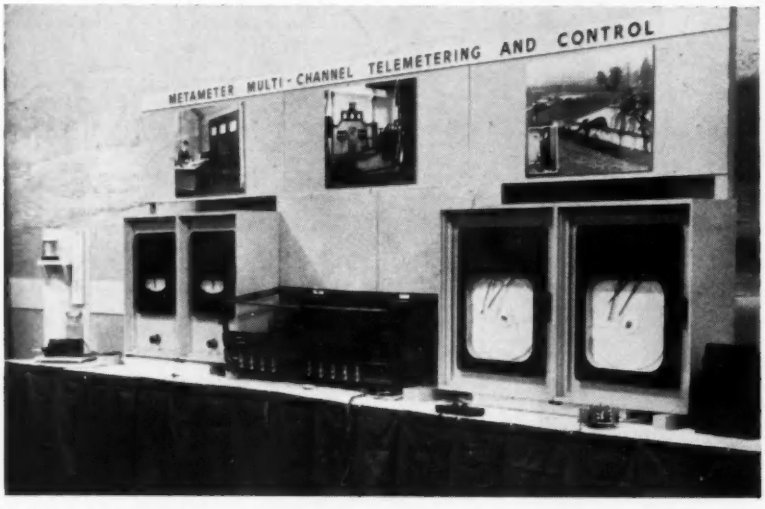
Gothic Works, Thornton Road, Croydon, Surrey

W32

TELEMETERING EQUIPMENT DEMONSTRATIONS

The interest which gas engineers are showing in the use of instruments to assist them in development of grid supply schemes was displayed in Manchester recently when the Elliott-Bristol organization put on a demonstration of its multi-channel telemetering equipment at the Grand Hotel. Unlike large scale exhibitions where stand attendants can only give a limited amount of time to any one caller on their stand, the exhibition was conducted on more intimate lines. Admission was by invitation, and many of the gas engineers who visited the exhibition were able to sit down and command the undivided attention of the application engineers who were present to explain the equipment and deal with any critical points which were raised. The discussions which took place were, in fact, quite lively since an appeal was made to the distribution engineers who were present to make the occasion one where they really would say exactly what they thought about instruments generally, and the possibilities and limitations of the equipment which was displayed.

A member of the Elliott Bros., Ltd., staff explaining some equipment at the demonstration. Left to right: Messrs. Cartledge, Teanby (Elliott Bros., Ltd.), Penkethman, Lenthall and Bradshaw.



Elliott 'Metameter' multi-channel telemetering equipment at the recent demonstration in Manchester.

There were two separate demonstration units on display, one illustrating the possibilities of the 'Metameter' multi-channel equipment which is being extensively used by the gas industry throughout the country, and the other the well known 'Elliottel' system of telemetering which has been in use for some years for holder stock and district information transmissions. There can be no doubt that as the various integration schemes in various parts of the country come into operation the need for instruments of a reliable type which will transmit information from unattended holder stations back to a supervisory control centre will increase, and the instrument industry generally is well alive to the important factors regarding such instruments. Without question the two most important requirements are accuracy and reliability. The schemes which are being evolved for the distribution of gas from main manufacturing centres to outlying districts are such that many different readings are required. For this reason the 'Metameter' equipment has been designed to carry up to 30 separate data transmissions over one pair of telephone lines. The 30 transmissions need not proceed from one point to another but can be picked up en route so that all are finally displayed in the supervisory control centre. It is also possible to pass back messages or control functions so that any abnormal condition at an outlying or unattended holder station can be rectified from a control centre by the supervisory controller.

The Petition for an independent royal charter for Manchester College of Technology was progressing satisfactorily, said Lord Woolton at a dinner in London on May 2. The charter will make the college independent of Manchester City Council.

N.C.B. Scholarships

The National Coal Board is introducing a new scheme for 'industrial relations' scholarships. Four such scholarships, tenable either at Ruskin College or a university, are being offered this year to mineworkers with not less than five years' underground experience. The courses, in the social sciences, will lead to either a degree or a diploma.

The scholarships are intended to train men for labour relations work in the industry. They are worth about the same as state scholarships, and there are additional allowances for married men.

North Eastern Consumer Service

It is the policy of the North Eastern Gas Board to have a really first class consumer service centre in each of its centres of population, said Dr. R. S. Edwards, Chairman of the North Eastern Gas Board, at the opening by the Mayor, Alderman Joseph Rhodes, of the new gas showrooms at Morley, near Leeds. Dr. Edwards said they were satisfied that they had given the housewives of Morley a place where they could get the most efficient and economical gas appliances and—in these days of demands for pure air—of smokeless fuel appliances also.

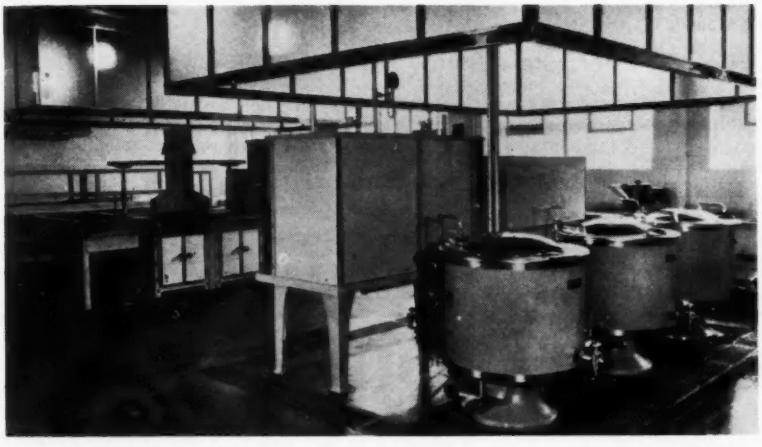
The premises, among the most modern in the country, stood on a site that became the property of the Board on vesting day, he said. It had been the property of the former local gas undertaking which had intended to put a service centre on the same site, but the Board had not been able to proceed until a few months ago owing to restrictions.

Work was started only in January last and Dr. Edwards expressed thanks to the architect and contractors for the speed at which the premises had been completed, particularly in view of the weather conditions while building had been in progress. The Mayor expressed pleasure that the building had not been put up 'on the cheap.'

REPLANNED 'TEDDINGTON' WORKS RESTAURANTS

To cater for the greatly increased number of workers now employed at their Cefn Coed factory, near Merthyr Tydfil, Teddington Aircraft Controls, Ltd., have recently completed an extensive rebuilding programme for the works restaurants. The old main kitchen, designed for a staff of 600 with a peak capacity of 200 meals per day, has been absorbed into the factory space and a new kitchen has been built which can deal comfortably with the demands of the present staff of 1,300.

The restaurant block now covers an area of 12,000 sq. ft. containing, on the ground floor the main dining room, stores, and up-to-date kitchen. The staff dining rooms are on the first floor with the service section situated immediately above the kitchen. A service lift connects the two and a steam-heated cabinet hot-closet has been installed on the first floor.



View of the kitchen showing the spacious layout of the up-to-date gas and steam cooking equipment

All service is on the cafeteria principle, and a new 40 ft. stainless steel hot and cold service counter, fitted with three bain-maries, has been installed in the main dining room. Two special type steam-heated cabinet hot closets have been built into the back wall of the service counter and an ice conservator stands in a recess.

The menu changes daily and offers a choice of two hot dishes, four vegetables, four cold dishes, and various beverages. A typical meal consisting of joint, two vegetables, sweet, and beverage costs 1s. 7½d. in the main dining room. In addition, junior employees below a certain salary grade are allowed a discount of 6d. from the cost of their meal.

The new kitchen, 57 ft. by 33 ft., with subsidiary rooms for vegetable store, dry store, and office, is equipped with the gas and steam cooking appliances and is capable of supplying over 800 main meals per day plus light refreshments for a buffet service during staff breaks. Cooking equipment, all by R. and A. Main, Ltd., has been arranged in two main islands. In one island, the equipment comprises one DYCU.4/62 four-oven central gas range with Bain Marie extension, one RF.1/3329 cabinet type roasting oven and one 93GP./1 general purpose oven adapted to incorporate a gas-heated proving oven underneath. The other island is made up of three S.B.P.30 steam jacketed boiling pans, one G.F.56 two-pan gas heated fish fryer and one 2.WS/L.30 battery of two wet steaming ovens.

In the pastry and vegetable preparation sections are three stainless-steel vegetable preparation sinks, two electric potato peelers and peel traps, a chipping machine, one 30 qt. Hobart S.E.300 mixing machine and a 5 ft. by 2 ft. marble-topped pastry preparation table. The pot-washup department, containing two double-compartment stainless-steel pot sinks with drainers, is also at the rear of the kitchen. The crockery-washup section is equipped with a Dawson Model 'A' dish washing machine complete with stainless-steel in and out tabling and a subsidiary stainless-steel sink unit, and deals comfortably with the crockery load.

The planning, supply, and installation of the appliances was carried out by R. and A. Main, Ltd., in collaboration with Mr. W. Martin-Hurst, Managing Director, Teddington Aircraft Controls, Ltd. Mr. P. Hurran (late of Butlins) is the Catering Manager. The engineering and maintenance departments of Teddington Aircraft Control, Ltd., were responsible for all pipe services, plumbing, and electrical work under the direction of Mr. J. Langford, Plant Engineer.

The efforts made by Lord Kemsley and his brother, the late Lord Camrose, to bring industries to Merthyr Tydfil in the depression before the war were recalled by the Mayor of Merthyr (Councillor Morgan Osborne) when the freedom of the town was conferred upon Lord Kemsley at a ceremony in the Miners' Hall on April 28. Lord Kemsley, who left Merthyr for Fleet Street 50 years ago, was presented with the freedom scroll in a silver gilt casket.

New Huddersfield Gas Offices

The North Eastern Gas Board have acquired the premises of a former Huddersfield church and are to build on the site new showrooms and demonstration rooms.

The premises are those of the former High Street Methodist Church which closed for worship in 1944 and were later purchased by a Huddersfield newspaper with whom the Board have completed negotiations.

Mr. J. G. Tilley, Group General Manager, said the development of the site would be to replace the present inadequate premises.

'To meet the requirements of the Town Planning Authorities,' said Mr. Tilley, 'the new building will have to be one of four storeys and it is likely, therefore, that over the showrooms there will be a suite of offices, some of which will be used by the Board and others available for letting.

'The new premises are badly needed. The existing showrooms in Byram Street were unsatisfactory before nationalisation, but with the addition of the accounts department (formerly a Huddersfield Corporation responsibility) and the increase in business at the showrooms they have become grossly overcrowded. The acquisition of the High Street property will mean that we shall have up-to-date premises in an area which is scheduled for development as a municipal centre.'

Sixth Year Results Forecast

The North Western Gas Board's latest *Quarterly Bulletin* estimates gas sales in the North West during the Board's sixth year of operation (ended March 31, 1955) at between 350-355 mill. therms; an increase of between 4 and 5% over the total of 337 mill. therms sold in 1953-54.

The rise in national gas sales during the year is estimated at around 4%, on the basis of the increase in gas made available for public supply to a total of 595,151 mill. cu.ft. in the 52 weeks ended March 27, 1955 (up 4%).

These advance estimates of gas sales are included in the course of a general survey of sixth-year activity in the North Western Gas Board area, seen against the gas industry as a whole.

The division of gas sales among different classes of consumers is as yet available only for the first nine months of the sixth financial year (April-December, 1954), and an analysis of sales in this period, given in the *Bulletin*, shows that the rise in industrial gas sales (up 8% nationally and 14% in the North West) has been the main factor in the increase of total gas sales.

Sales to domestic consumers were up by 1% in Britain as a whole and by 1½% in the North West, while sales to commercial and other users were up 6% nationally and 4% in the North West.

Coke sales in the 52 weeks ended March 27, 1955, amounted to 11,093,000 tons in the country as a whole and 1,718,000 tons in the North Western Area; showing increases of 5 and 7% respectively over sales in the previous year.

MANCHESTER AND DISTRICT SECTION

Manchester and District Section of the Institution of Gas Engineers held its fifth annual general meeting at the Grand Hotel, Manchester, on April 29, when Mr. W. S. Hubbard (Production Engineer, Liverpool Group, North Western Gas Board) was installed as Chairman. The meeting was preceded by a luncheon to which the Chairman (Mr. H. Johnston, O.B.E.) welcomed Mr. D. P. Welman (Chairman, North Western Gas Board), Colonel W. M. Carr, C.B.E., T.D., Mr. A. K. Collinge, Mr. A. H. Barrington (President, Manchester Juniors), Mr. C. H. Bamber, Mr. T. Haworth, Mr. R. L. Greaves, Mr. C. H. Leach, Mr. J. M. McLusky and Mr. N. G. Appleyard.

MR. H. JOHNSTON, in his report on the Institution Council, said it had been suggested that certificates for new members should be presented at district meetings instead of being sent to them through the post. On behalf of Manchester, the view had been expressed that the presentation of certificates at meetings would be a good lead in. The Council turned down the proposal, one of the reasons being that although certificates were available for new members they had to be paid for, and not every member wished to have one. The Section had obtained approval of the inauguration of a Christmas Lecture to juveniles.

Mr. Johnston welcomed 16 new members, and presented to Mr. D. Cooper the appropriate certificate on his having passed the Associate Membership Examination.

The meeting confirmed the recommendation of the Management Committee to donate 35 guineas to the benevolent fund.

Appointments were made as follows: Mr. W. S. Hubbard to Council of the Institution; Mr. John Grayston to serve on the Council of the Manchester Juniors; Mr. A. Cole to serve on the Council of Yorkshire Juniors; Messrs. J. Castle, W. B. Harrison, and H. Thomas to serve on the Lancashire District Gas Education Committee; Messrs. N. G. Appleyard, J. G. Tilley, and J. M. McLusky to serve on the Yorkshire District Gas Education Committee; Mr. W. F. S. Howell to serve on the North West Divisional Council, National Smoke Abatement Society; and Mr. H. Jack to serve on the Yorkshire Divisional Council of National Smoke Abatement Society.

The result of the ballot for the election of officers and committee members was declared as follows: *Chairman*, Mr. W. S. Hubbard (Liverpool Group Production Engineer); *Senior Vice-Chairman*, Mr. J. M. McLusky (General Manager, North Eastern Gas Board, Wakefield); *Junior Vice-Chairman*, Mr. R. L. Greaves, M.B.E. (General Manager, South Lancashire Group); *Auditors*, Mr. A. Harrison (Sales and Service Officer, Manchester), and Mr. J. A. Seabrook (Engineer and Manager, Huddersfield-Halifax Group, Elland undertaking); *Hon. Secretary*, Mr. A. H. Nicholson (General Manager, East Lancashire Group); *Hon. Treasurer*, Mr. J. H. Clegg (District Service Manager, Accrington district); *Members of the Committee*, Mr. J. Castle, B.SC. (General Manager, Wirral Group), Mr. F. H. Nicholls (Engineer and Manager, York-Harrogate Group, York undertaking), and Mr. J. H. Richmond (General Manager, Mid-Cheshire Group).

MR. D. P. WELMAN (Chairman, North Western Gas Board) said the gas industry must take a front seat in the industries of the country. Mr. Hubbard was taking the chairmanship at a psychological moment. The year ahead was likely to be most important for the gas industry in many respects, probably the most important for 50 years. Its future was wider than ever it had been. The year ahead would be a year of opportunities, and he hoped full advantage would be taken of them. Mr Welman concluded his brief address by formally inviting members of the Manchester and District Section to visit the group in which the new Chairman was best known. He assured them of a cordial welcome to Liverpool.

MR. HUBBARD presented to Mr. Johnston on behalf of the Section a replica of the Chairman's badge of office and a pair of silver sauce boats in a handsome case.

Mr. Hubbard then presented his Chairman's Address, which is reported on pp. 450-457 of this issue.

He was accorded a cordial vote of thanks on the proposition of MR. J. M. MCLUSKY, seconded by MR. R. L. GREAVES.

Company Meeting

PARKINSON & COWAN

RECORD TURNOVER

SIR GEORGE JESSEL'S REVIEW

The fifty-fifth annual general meeting of Parkinson & Cowan Ltd., was held on May 11 in London.

Sir George Jessel, BART., M.C., the Chairman, in the course of his review, said:—

The year's operations achieved a record turnover and resulted in a trading profit of £383,000 (£330,000 for 1953). After allowance for depreciation, taxation, and other charges, our group net profit was £89,419 (£80,409 last year, plus £64,330 non-recurring tax adjustments).

After payment of preference dividend £70,797 is available for ordinary stockholders, representing 17% on the ordinary capital, after providing for the higher profits tax on dividends paid and proposed. Your directors recommend a dividend of 9% as for 1953.

At the end of 1954 the book value of net assets, excluding good will, represented 36s. 10d. per £1 ordinary stock. We continue to adopt a policy of drastic depreciation of our fixed assets and £145,000 has been applied in this way in 1954 (£118,000 in 1953).

Current assets, including stocks, exceed current liabilities by £1.38 mill.

Last year £200,000 of 3½% debenture stock was issued at the favourable price of 93½%.

Group Activities

The Renown Mark V cooker remains the aristocrat of gas cookers, and the 'Live Water' washing machine is now widely distributed throughout the country. We are starting manufacture of a new medium-priced cooker, the Parkinson 'Pearl,' which we shall produce in substantial volume, and we have another appliance in an advanced stage of preparation about which I can talk more freely next year. Your Board therefore entertains the highest hopes on the future development of our appliance interests.

Our Monovector space heater is in great demand, and is being produced in large quantities.

Our interests in the manufacture of gas and fluid meters are in excellent shape, and our products enjoy a substantial and increasing share of the domestic market. We have an expanding allied business in industrial metering and pumps.

The division making electricity meters and precision components has a full order book for 1955.

Our leather business has recovered from a severe depression and is again operating satisfactorily.

Our business in gas-drying and industrial heating equipment is progressing in a gratifying manner.

Despite intensified competition our export division continues to expand its sales.

Sales Staff

We are mindful that our most important asset is our 3,000 loyal employees. By apprenticeship and professional training schemes we seek to encourage ability and to raise continually our level of skill in manufacture, selling, engineering, and administration.

Prospects

The recent restrictions in hire purchase facilities are causing a decline in demand for some types of domestic appliances. It may be that this decline is temporary—indeed there are indications that this will be so. While we face the longer future with undiminished confidence, I cannot say more of the immediate prospect than to utter this note of caution.

The report and accounts were adopted.

The retiring Directors, Sir George Jessel and Mr. A. Gordon, were re-elected, and the Chairman concluded with a tribute to the Managing Director, Mr. H. P. Barker, and to the staff and workpeople.

AMAL

Calibrated Jets & Injectors

to meet a specification of consumption

A1

AMAL LTD., HOLDFORD ROAD, WITTON, BIRMINGHAM, 6

CRANE

VALVES for Gas, Steam, Water, Oil and Air

WELDING
GUNNING
SPRAYING
OF GAS RETORTS

EB

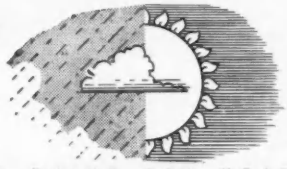
Write for particulars of how E. B. Service can help in reducing maintenance costs. Manufacturers of all types of Cements.

E. B. REFRACTORY CEMENT CO. LTD.
Oakfield Offices, Brettell Lane, Stourbridge

Protection of Steel Structures

AVARC

SILICA-GRAPHITE PAINT

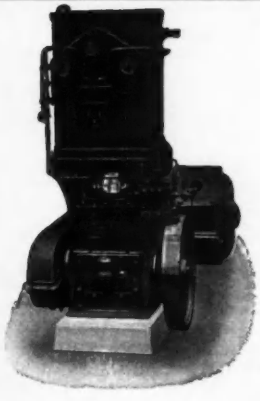


FIGHTS ALL CLIMATES
PARTICULARLY BRITISH

C. R. AVERILL LIMITED,
Alyn Mills, Caergwrle, Wrexham, North Wales
Tel: Caergwrle 64/65 Cable Address: Crucigraph, Caergwrle
LONDON OFFICE: 52 Bedford Row, W.C.1 *Tel: HOLborn 5113*

THE CHEAPEST PAINT PER YEAR OF SERVICE

AV155

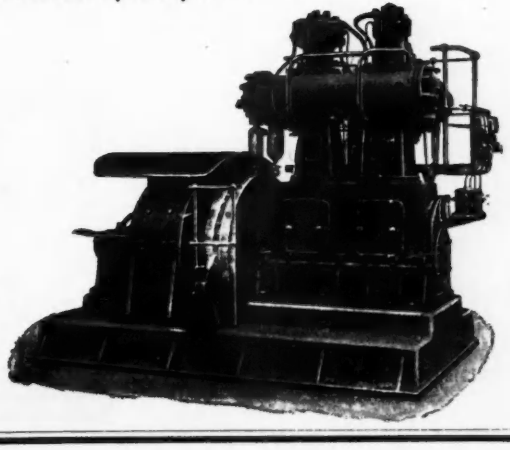


HIGH PRESSURE GAS COMPRESSORS *for*

pressures up to 5,000 lbs. per sq. in.

The illustrations show two high pressure gas compressors which we made recently to order. As specialists in the design and manufacture of compressors for both air and gases, we make compressors for a wide range of capacity and pressure up to 5000 lbs. per sq. inch.

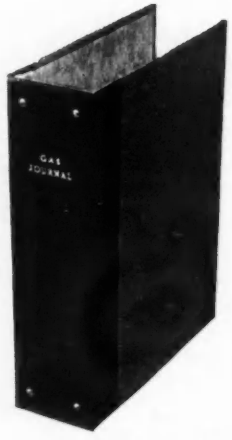
The compressor shown above has a capacity of 25 cu. ft. of free hydrogen per minute compressed to 3000 lbs./sq. inch. The illustration on the right shows a four-stage compressor with a delivered capacity of 200 cu. ft. of free town's gas per minute compressed to 5000 lbs. per sq. inch.



For full information regarding gas compressors, write, giving particulars of the duty required, to—

REAVELL & CO., LTD.
RANELAGH WORKS, IPSWICH
Telegrams: "REAVELL, IPSWICH." Phone Nos. 2124 & 2125

Bind your JOURNAL each week



Gold lettered on the spine complete with instruction sheet.

No loose copies to be mislaid

We offer Journal readers a simple method of temporarily binding their copies as received week by week. No time lost searching for a particular issue; Journals removed and replaced in a few seconds. Designed to hold 13 issues, and whether completely or only partially filled the book effect is always maintained.

Price 12/6 each plus 9d. postage.

Obtainable from:

WALTER KING, Ltd., 11, Bolt Court, Fleet St., London, E.C.4

PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price 1/3d.; by post 1/5d.

Subscription Rates: Home and Empire:—52/- per annum; Foreign:—60/- per annum. (Both payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 2/- per line (approx. 7 words)—minimum charge 10/-. A Box Number address occupies 2 lines, and a furtner 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10 in. deep × 7 in. wide; block screen 120.

BUSINESS MANAGER: S. T. CULLEN

MIDLANDS MANAGER: G. B. Torrance, 42, Wychall Lane, King's Norton, Birmingham, 30. *Telephone:* Kings Norton 3868

NORTHERN MANAGER: Philip W. B. King, Flat 1, 7 Langcliffe Avenue, Harrogate. *Telephone:* Harrogate 67625.

SOUTHERN REPRESENTATIVE: A. Engelhardt, 11, Bolt Court, Fleet Street, E.C.4. *Telephone:* Central 2236-7

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: CENtral 2236-7. *Telegrams:* Gasking, Fleet, London.

OXIDE

DUTCH AND DANISH BOG ORE SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright. Highest prices paid for Spent Oxide

Send your enquiries to

GAS PURIFICATION & CHEMICAL COMPANY LIMITED

ESTABLISHED 1873

PALMERSTON HOUSE, BISHOPSGATE, LONDON, E.C.2.

Telegrams: "Purification, Stock, London." Telephone: London Wall 7938/9 & 7930

MUST WE BE HEROES ?

And fight the Fire Fiend without NU-SWIFT? But why? Even the Royal Navy don't do that. Please send us details of your wonderfully rapid and reliable Fire Extinguishers—BEFORE IT IS TOO LATE!

Name.....

Address.....

Post NOW to Nu-Swift Ltd. 25 Piccadilly W.1.

In Every Ship of the Royal Navy

"KLEENOFF" *

THE COOKER CLEANER

"KLEENOFF"

FIBRE BRUSHES
RUBBER MOPS

"KAY-DEE" *

KETTLE DESCALER

for resale to the public, and in bulk for works use.

BALE & CHURCH, LTD.

7, CROMPTON WAY, CRAWLEY, SUSSEX

AUCTION

Re Pinxton Coking Co. Ltd., (In Voluntary Liquidation) By Order of W. Edmund Carnalley, Esq., F.C.A.

PINXTON, NOTTINGHAM

COKING PLANT

Coal Elevators & Conveyors, Jeffrey Diamond 36" HAMMER MILL
26 Coppee Coke Ovens, Ram & Quenching Cars & Track
Coke Screening & Handling Plant

BY-PRODUCTS PLANT

Ammonia Concentration Plant, Benzole Recovery & Rectification Units
Electric Gas Exhausters & Boosters, Holmes 12" × 36" Connersville Meter
Pooley 40-ton Dial type RAIL WEIGHBRIDGE Six 30ft. by 8ft. Lancashire Boilers
A. C. Motors to 100 h.p., Switchgear & Cabling
Steam Pumps, Compressor Sets, Smith's 3-ton Loco Crane, Rail Sidings
Maintenance Plant, Stores, Laboratory Equipment, Etc.

LEOPOLD FARMER & SONS

Will sell the above by Auction at
THE MINERS WELFARE HALL, PINXTON
TUESDAY & WEDNESDAY, 28th & 29th JUNE, 1955
Preceded by the Offering of

THE FREEHOLD PROPERTY comprising an area of 25 ACRES with BUILDINGS and SIDINGS

Catalogues (6d. each) and particulars of LEOPOLD FARMER & SONS, Industrial Property, Plant & Machinery Auctioneers & Valuers, 46 Gresham Street, London, E.C.2. Tel: MON 3422

PATENTS

KINGS PATENT AGENCY, LTD
(Director, B. T. King, A.I.M.E., Patent Agent) Advice, Handbook, and Consultations free. 146a, Queen Victoria Street, London, E.C.4. 'Phone: City 6161.

PUBLICATIONS

GAS ACCOUNT CALCULATORS

SUPPLIED either by Price per Therm or Thousand, for any specified Calorific Value, in book form, office charts, or pocket charts for Meter Inspectors, printed in clear type. Write for particulars to F. H. WAKELIN, LTD., Calculator Specialists, 354, WHEELER STREET, BIRMINGHAM.

'Phone: Northern 0989. 'Grams: Reckoners, B'ham.

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.

NATURAL BRITISH.

BOG (DUTCH and DANISH) ORE.

SPENT OXIDE.

LONDON ROAD, LEICESTER.

Telegrams: "BRIPURIMAT"
Telephone: 59086

APPOINTMENT WANTED

ENGINEER, 37, Indentured Apprenticeship, Light Engineering, including Foundry, Machine Tools, Metrology, Sales Trained, some commercial experience, fully conversant with latest technical, supervisory, and manufacture of gas meters, water heaters and other allied products, seeks progressive position in managerial or representative fields. Apply: No. 239, *Gas Journal,* 11, Bolt Court, Fleet Street, London, E.C.4.

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

SCOTTISH GAS BOARD

GLASGOW DIVISION
GLASGOW DISTRICT
SUPERINTENDENT
Central Stores and Workshops
A.P.T. 10/12 (Prov. "A") £760-£960

APPLICATIONS are invited from persons qualified and experienced in the management of large-scale stores and workshops handling the distribution of Gas Appliances and Fittings.

The duties will include the supervision and management of the stores, general workshops, garage and attendant personnel.

A knowledge of gas appliances and fittings is desirable.

The post is pensionable and the successful candidate may require to undergo medical examination. Placing within the above scale will be in accordance with training and experience.

Applications, endorsed S/CS., giving full particulars and bearing the names of two referees should be in the hands of the undersigned on or before Wednesday, June 1, 1955.

D. F. YOUNG,
Divisional Controller.

30 John Street
Glasgow C.1.
P.O. Box No. 78

REPRESENTATIVE required by established manufacturers of industrial instruments widely used by gasworks and gas using industries, where they contribute much to economy and efficiency.

Area covers London and Home Counties. Previous selling experience necessary with good technical background. Knowledge of gas manufacture or distribution would be an advantage, but applications equally invited from men with good record of selling technical equipment.

A car is provided, remuneration by salary and bonus on results. Expenses are paid.

This position offers good scope and a valuable combination of selling and technical experience. Write giving age, details of education and previous experience to the Directors, Walker, Crosweller & Co., Ltd., Whaddon Works, Cheltenham.

EASTERN GAS BOARD

TOTTENHAM DIVISION
MECHANICAL ASSISTANT—SOUTHGATE WORKS

APPLICATIONS are invited for the appointment of MECHANICAL ASSISTANT at Southgate Works. Candidates should be Corporate Members of the Institution of Mechanical Engineers or possess an equivalent qualification.

The successful applicant will be one of the Technical Assistants of the Works Engineer and will be responsible to him for the Mechanical and Constructional Maintenance on the Works and must be capable of organising his work on a planned basis. Electrical experience would be an advantage. He should be experienced in the supervision of Craftsmen.

The successful candidate may be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

The salary for this appointment will be in accordance with Grade A.P.T. 10/11 (Metropolitan) (£790-£940) per annum of the National Salary Scales for Gas Staffs.

Applications stating age, qualifications and experience, should reach the Divisional Personnel Manager, Woodall House, 658, Lordship Lane, Wood Green, N.22, not later than Monday, June 6, 1955.

(Classified advertisements continued on page 474)

APPOINTMENTS VACANT (ctd.)

NORTHERN GAS BOARD

WESTERN GROUP
ENGINEERING ASSISTANT
CARLISLE DIVISION

APPLICATIONS are invited for the position of ENGINEERING ASSISTANT on the staff of the Carlisle Division.

Salary within Grades 6 and 7 (£565-£700 per annum), placing according to age and experience.

The successful candidate will be required to pass a medical examination and join the Board's Staff Pension Scheme.

Applications stating age, experience and giving full details of training and qualifications, together with the names of two referees, should be addressed to The Divisional General Manager, Gas Works, Rome Street, Carlisle, to arrive not later than Saturday, May 28, 1955.

A. R. CROFT,
Group General Manager.

50, Castle Street,
Carlisle.
May 5, 1955.

NORTHERN GAS BOARD

(TYNESIDE DIVISION)

APPLICATIONS are invited for the post of SENIOR CHEMIST at the Elswick Works of the above Division.

Candidates should be suitably qualified to undertake full responsibility, under the Works Manager, for supervision of chemical staff, and for all chemical testing and control of modern carbonising plant and ancillary equipment on a large Works.

The appointment will be within Grade APT.8 (£660-£740 per annum) of the National Salary Scales for Gas Staffs.

The successful candidate will be required to pass a medical examination and be subject to the Board's Pension Scheme.

Applications, stating age, experience, qualifications and giving names of two referees should be addressed to the undersigned within fourteen days of this advertisement.

W. SUTCLIFFE,
Divisional General Manager.

30, Grainger Street,
NEWCASTLE UPON TYNE, 1.

NORTHERN GAS BOARD

(TYNESIDE DIVISION)

APPLICATIONS are invited for the post of SENIOR CHEMIST to the above Division.

Applicants should hold either a University degree in science or the Associateship of the Royal Institute of Chemistry and preferably have had experience in the carbonising industry. The person appointed will be required to take control of the laboratory in the absence of the Chief Chemist.

The appointment will be within Grade APT.12 (£835-£960 per annum) of the National Salary Scales for Gas Staffs.

The successful candidate will be required to pass a medical examination and be subject to the Board's Pension Scheme.

Applications, stating age, experience, qualifications and giving names of two referees should be addressed to the undersigned within fourteen days of this advertisement.

W. SUTCLIFFE,
Divisional General Manager.

30, Grainger Street,
NEWCASTLE UPON TYNE, 1.

FIRST CLASS Gasholder Erection Foremen required for various Contracts in the United Kingdom. Applications, stating age and full details of experience, to No. 241, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

JNR. AND SNR. DRAUGHTSMEN required for well known gas appliance manufacturers in N. London. Experience in designing industrial gas appliances desirable but not essential. Write in strictest confidence to No. 240, *Gas Journal* 11, Bolt Court, Fleet Street, London, E.C.4.

CHIEF SALES ENGINEER. Must be fully qualified with considerable experience of design and construction of large materials handling plants. Age 35-50 years. Applicants who have held good executive positions in a substantial organisation preferred. Salary commensurate with ability and experience. Pension scheme. Accommodation available. Applications to Managing Director, Robert Cort & Son, Ltd., Reading Bridge Ironworks, Reading.

WEST MIDLANDS GAS BOARD

WORCESTERSHIRE-HEREFORDSHIRE
DIVISION
DIVISIONAL MAINTENANCE FITTER

APPLICATIONS are invited for the above post for which the wage rate will be 4s. 4½d. per hour.

The successful applicant will be required to carry out repairs and maintenance of gasworks plant at a number of small undertakings and in travelling about the Division will be required to drive a Board motor van. Possession of a current driving licence is therefore essential.

Applications, stating age, qualifications, experience and present position, together with the names of two referees, should be addressed to Mr. C. F. W. Rendle, Divisional General Manager, West Midlands Gas Board, Newtown Road, Worcester, to reach him within fifteen days of the appearance of this advertisement.

J. C. INGRAM,
Secretary to the Board.

EAST MIDLANDS GAS BOARD

NOTTS & DERBY DIVISION
ASSISTANT WORKS ENGINEER—ILKESTON
UNDERTAKING

APPLICATIONS are invited from suitably qualified persons for the above appointment at the Ilkeston Works.

The plant at Ilkeston consists of modern continuous vertical retorts with the normal ancillary installations and has a gas making capacity of 1 million cu.ft. per day.

Candidates, who should be Corporate Members of the Institution of Gas Engineers, must have had experience in the operation of plant of the above type and in the control of labour.

The salary payable will be rising to £700 per annum commencing at a figure commensurate with qualifications and experience.

The post is pensionable and the successful applicant will be required to pass a medical examination.

Applications, stating age and giving details of education, qualifications and experience, together with the names of two referees, should be addressed to the undersigned not later than Wednesday, May 25, 1955.

K. L. PEARCE,
Divisional General Manager.

East Midlands Gas Board,
Notts & Derby Division,
P.O. Box No. 62,
Friar Gate,
DERBY.

DOWSON & MASON GAS PLANT CO., LTD., Alma Works, Levenshulme, Manchester 19, have vacancies for JUNIOR DRAUGHTSMEN for the design of Industrial Furnaces. The work is interesting and varied in nature. Applicants should have knowledge of this type of work and also served a recognised engineering apprenticeship. Good working conditions, 5 day week. Pension Scheme. Applicants should state age and full details of experience and qualifications.

NORTH WESTERN GAS BOARD

APPLICATIONS are invited for the following pensionable appointments:—

EAST LANCASHIRE GROUP
DISTRICT ENGINEER (DISTRIBUTION)

The salary will be within Grade A.P.T.10 (£760-£860 per annum).

The district includes Burnley, Nelson, Colne, Padiham, Barnoldswick and Earby, containing approximately 68,000 consumers and 490 miles of main.

The successful applicant will be responsible to the Senior District Engineer for the supervision of all distribution engineering work within the district, and should be suitably qualified.

Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B., East Lancashire Group, Cardwell Place, Blackburn, within 14 days.

LIVERPOOL GROUP
ENGINEERING DRAUGHTSMEN

The salary will be within Grades A.P.T. 6/8 (£565-£740 per annum), according to experience.

Applicants should have had a sound engineering training and be experienced in the design and construction of gasworks or chemical plant, including building construction, etc. A knowledge of reinforced concrete and structural steelwork would be considered an advantage.

Applications should be made on the official form obtainable from the Chief Personnel Officer, N.W.G.B. (Liverpool Group), Radiant House, Bold Street, Liverpool, 1, and returned to him within 14 days.

MISCELLANEOUS

FOR Rapid and Permanent Repairs to Conveyor Belting use the "SELVULIZE" Cold Vulcanizing System. Can also be used for Cold Vulcanizing Endless Joints. Inexpensive and easy to use. Write for further details to:—
G. E. SIMM (ENGINEERING), LTD.,
27, Broomgrove Road,
SHEFFIELD, 10. TEL.: 62981.

FOR Pipe Installation or any lifting and pulling work use the TIRFOR Machine. Any height of lift or length of pull. Entirely hand operated. Write for catalogue to:—
TIRFOR, LIMITED,
27, Broomgrove Road,
SHEFFIELD, 10. TEL.: 62981.

PLANT FOR SALE

FOR SALE:—Two Reavell Single Stage Turbo Blowers, size B.431, capacity 20,000 cu.ft. per minute, against a pressure of 30" W.G. Speed 2,920 r.p.m. Require 125 H.P. to drive. Excellent condition.

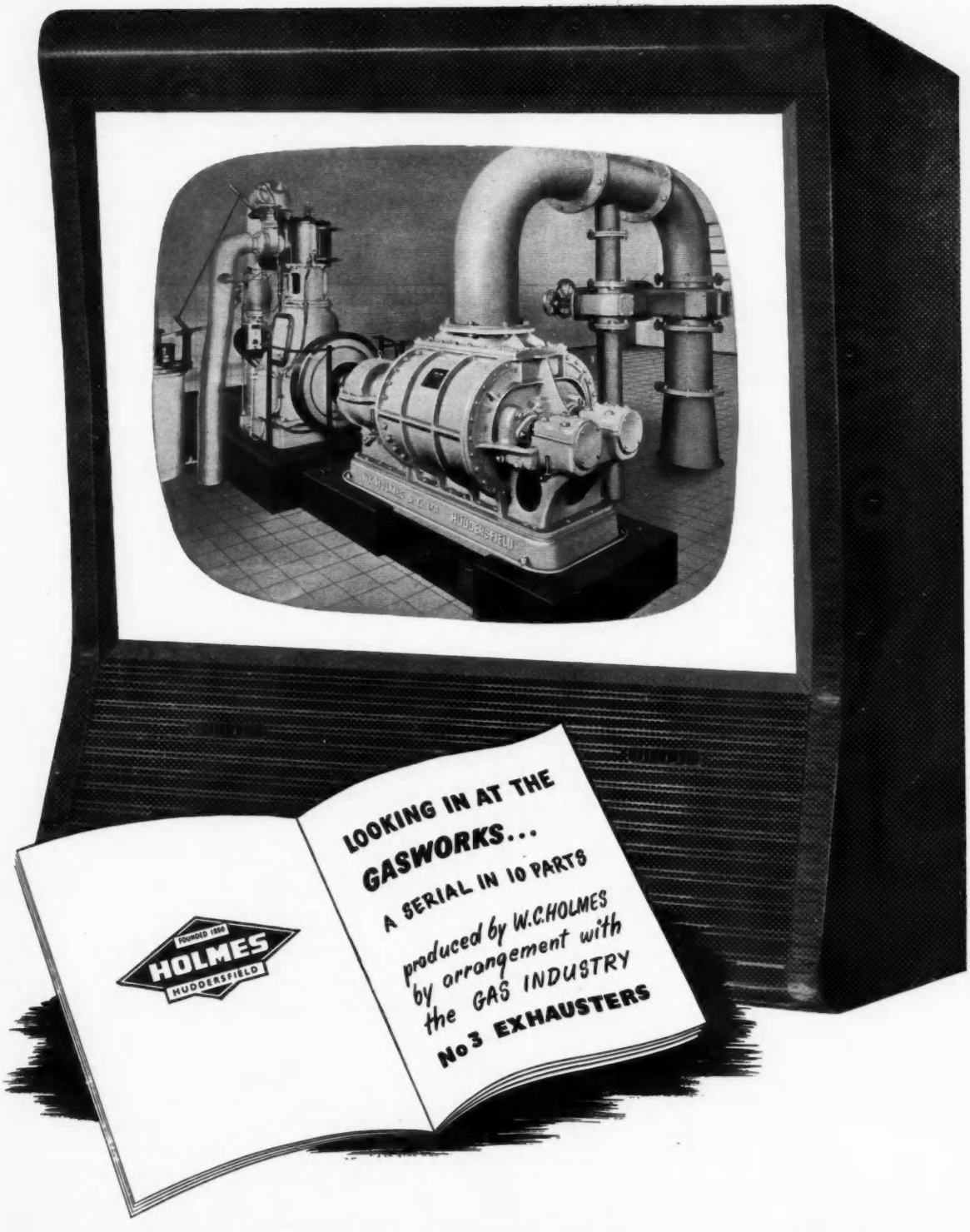
Three Howden Induced Draught Fans for waste heat gas, capacity 21,000 cu. ft. per minute, 15" W.G. at 1,440 r.p.m. Runner 46½" dia. Require 100 H.P. to drive. Weight approx. 3½ tons each. Excellent condition.

Large stocks of NEW and RECONDITIONED VALVES for steam, water, oil, etc., up to 24" bore. List on application.

G. E. SIMM (MACHINERY), LTD., 27, BROOMGROVE ROAD, SHEFFIELD, 10. Tel.: 64436.

STRINGER BROTHERS
ALBION WEST BROMWICH
S.B IRON & STEEL PLATES & SHEETS BARS & SECTIONS
Telephone: WEST BROMWICH 0436-7

Commercial T.V. with no apologies



W. C. HOLMES & CO LTD · HUDDERSFIELD · LONDON · BIRMINGHAM

C4574

WHY

man-cooling?

BECAUSE MEN CANNOT WORK at full stretch under the oppressive conditions existing in industrial "hot spots" without some means of relief. Often they resort to "taking a breather". But "breathers" are costly and time-wasting.

Consider the alternative.

The "Tornado" method of man-cooling definitely encourages production all the time. Man-cooling fans deliver, for as long as is necessary, a brisk, cooling air current which relieves excessive body heat and improves breathing conditions. Designed particularly for use in the "heavy" trades they combine an easy portability with robust construction — two essential characteristics.

If your concern is for workers in iron and steel works, foundries, boiler houses, gas retort houses, glass works or "lighter" industries where efficiency is bound up with the maintenance of comfortable working conditions then you should see Publication No. 9/7.

A copy is waiting for you.

ASK FOR PUBLICATION NO. 9/7

Keith Blackman LIMITED

MILL MEAD ROAD, TOTTENHAM, LONDON, N.17

'Phone: Tottenham 4533 (twelve lines) 'Grams: "Keithblac, Nophone, London."

BRANCH OFFICES AT MANCHESTER, BIRMINGHAM, LEEDS, GLASGOW, NEWCASTLE-ON-TYNE, PENARTH near CARDIFF, AND BELFAST

486

STEAM WASTE *IS COSTLY*

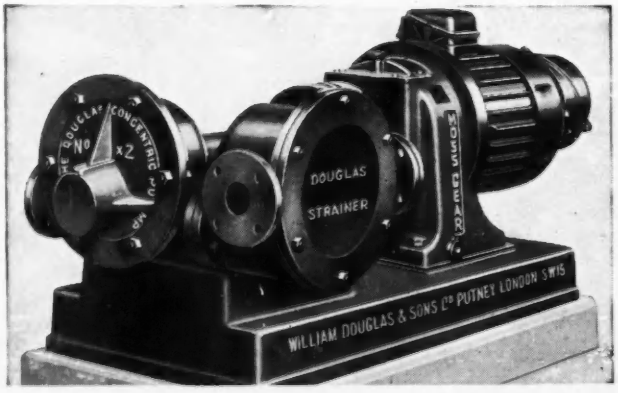
A Revelation to Users of Steam

FURMANITE STOP THAT LEAK

See "Gas Journal," Sept. 22, 1954, P.706

FURMANITE ENGINEERING CO. (1929) LTD.,
9, POPLAR ROAD — BIRKENHEAD
Telephone: Birkenhead 1240.

PERMANENTLY SEALS LEAKS WITHOUT STOPPING YOUR PLANT



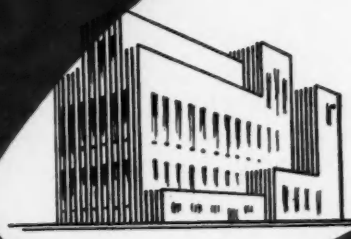
"THE DOUGLAS PUMP"

SHEWN FITTED WITH SUCTION PIPE LINE STRAINER, GIVING CHOICE OF TWO SUCTION LINES, PUMP & STRAINER STEAM HEATED. GOOD SUCTION. SLOW SPEED.

WILLIAM DOUGLAS & SONS LTD., PUTNEY - - LONDON, S.W.15.

Registered as a Newspaper. Printed by STRAKER BROTHERS LTD., E.C.2 for WALTER KING LIMITED, 11, BOLT COURT, FLEET ST., LONDON, E.C.4., Wednesday, May 18, 1955

Two sides to the question . .



CONTINUOUS

OR INTERMITTENT

. . one answer WEST'S

GLOVER-WEST CONTINUOUS VERTICAL RETORTS

C·O·L INTERMITTENT VERTICAL CHAMBERS

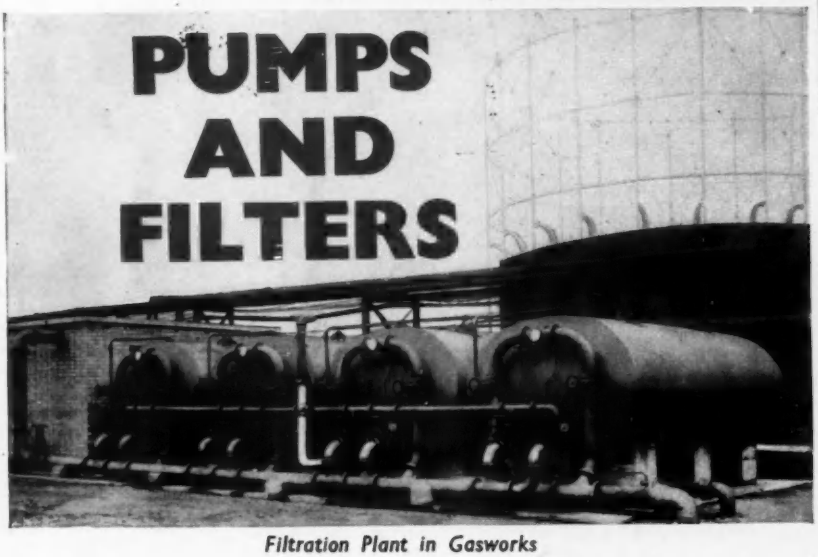
WEST'S GAS IMPROVEMENT COMPANY LIMITED

Albion Iron Works, Miles Platting, Manchester 10. Telephone: COLlyhurst 2961

London: Clements Inn, Aldwych, W.C.2. C.O.L. Division: Chandos House, Buckingham Gate, S.W.1.

Pulsometer Engineering
IN ASSOCIATION WITH Joseph Evans
NINE ELMS IRONWORKS . READING
CULWELL WORKS . WOLVERHAMPTON

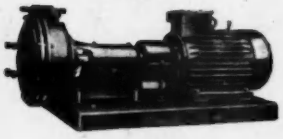
PUMPS AND FILTERS



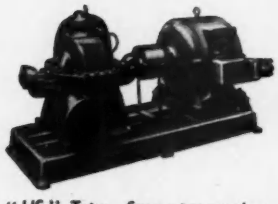
Filtration Plant in Gasworks

The illustrations show centrifugal pumps for light and heavy oil and liquor duties, stoneware and special metal pumps for handling acids and alkalis, pumps for circulating and washer duties, for clean water and fire services and for liquids containing abrasives.

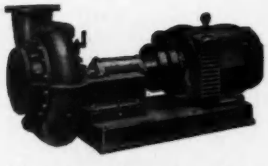
Rotary pump for Oil transfer duties



Stoneware pump for Corrosive and chemicals

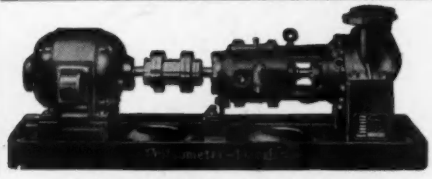


"HS" Type—for water services. All heads up to 500 feet.

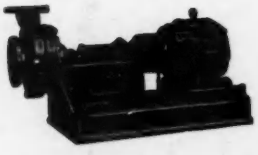


Slurry pump for coal washing and abrasive liquids.

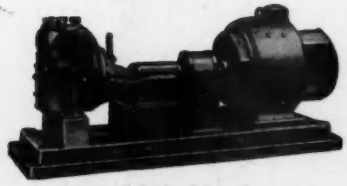
Reciprocating pump of modern design for Gas Works.



Pulsometer—Pacific type, based on latest American practice.



"JA" & "JB" types for high temperature water circulation.



Self priming centrifugal pumps.

LONDON OFFICE:- 39, VICTORIA STREET, WESTMINSTER, S.W.1.
BRANCHES:- BIRMINGHAM · CARDIFF · GLASGOW · LEEDS · MANCHESTER · NEWCASTLE - ON - TYNE